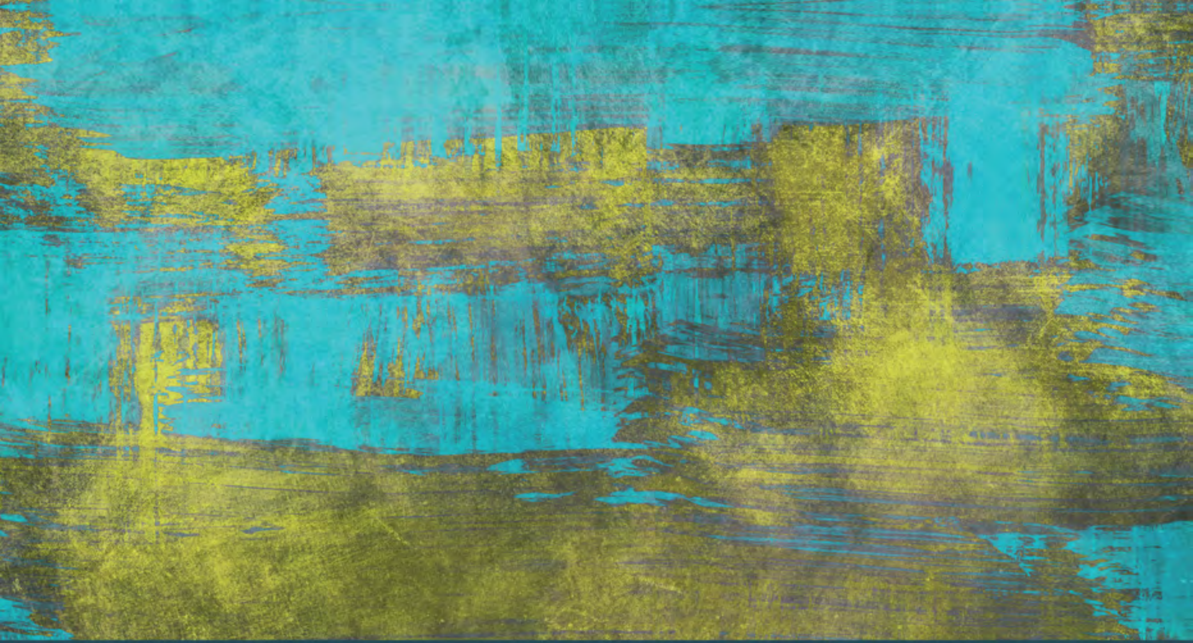


RE-MAPPING ARCHAEOLOGY

CRITICAL PERSPECTIVES, ALTERNATIVE MAPPINGS

Edited by
Mark Gillings, Piraye Hacıgüzeller and Gary Lock

ROUTLEDGE

Re-Mapping Archaeology

Maps have always been a fundamental tool in archaeological practice, and their prominence and variety have increased along with a growing range of digital technologies used to collect, visualise, query and analyse spatial data. However, unlike in other disciplines, the development of archaeological cartographical critique has been surprisingly slow; a missed opportunity given that archaeology, with its vast and multifaceted experience with space and maps, can significantly contribute to the field of critical mapping.

Re-mapping Archaeology thinks through cartographic challenges in archaeology and critiques the existing mapping traditions used in the social sciences and humanities, especially since the 1990s. It provides a unique archaeological perspective on cartographic theory and innovatively pulls together a wide range of mapping practices applicable to archaeology and other disciplines.

This volume will be suitable for undergraduate and postgraduate students, as well as for established researchers in archaeology, geography, anthropology, history, landscape studies, ethnology and sociology.

Mark Gillings is a Reader in Archaeology at the University of Leicester specialising in the theory and practice of Landscape Archaeology. His fascination with archaeological theory, fieldwork, Geographical Information Systems and prehistoric monumentality are reflected in books such as *Spatial Technologies and Archaeology* (2002); *Avebury* (2004); *Landscape of the Megaliths* (2008) and, most recently, a four-volume critical reader in *Landscape Archaeology* (2016).

Piraye Hacıgüzeller is a postdoctoral researcher at the Ghent Centre for Digital Humanities and the Archaeology Department of Ghent University. She has carried out postdoctoral research on the archaeological applications of GIS and critical mapping at KU Leuven and the University of Oxford, and is currently tasked with coordinating geospatial information activities at the Ghent Center for Digital Humanities.

Gary Lock is Emeritus Professor of Archaeology at the University of Oxford, with a long-standing interest in the use of computers in archaeology (*Using Computers in Archaeology. Towards Virtual Pasts*, 2003). He has been particularly interested in the use of Geographical Information Systems in archaeology and their relationship to landscape theory and fieldwork practice (*Archaeology and Geographical Information Systems*, 1995; *Beyond the Map. Archaeology and Spatial Technologies*, 2000).

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Re-Mapping Archaeology

Critical Perspectives, Alternative Mappings

Edited by Mark Gillings,
Piraye Hacıgüzeller and
Gary Lock

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2019
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2019 selection and editorial matter, Mark Gillings, Piraye Hacıgüzeller and Gary Lock; individual chapters, the contributors

The right of Mark Gillings, Piraye Hacıgüzeller and Gary Lock to be identified as the authors of the editorial material, and of the authors for their individual chapters, has been asserted in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. The purchase of this copyright material confers the right on the purchasing institution to photocopy pages which bear the copyright line at the bottom of the page. No other parts of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data
Names: Gillings, Mark, editor. | Hacigèuzeller, Piraye, editor. | Lock, G. R. (Gary R.), editor.
Title: Re-mapping archaeology : critical perspectives, alternative mappings / edited by Mark Gillings, Piraye Hacigèuzeller and Gary Lock.
Description: New York, NY : Routledge, 2018. | Includes bibliographical references and index.
Identifiers: LCCN 2018006252 (print) | LCCN 2018029827 (ebook) | ISBN 9781351267724 (Master) | ISBN 9781351267700 (ePUB) | ISBN 9781351267717 (Web PDF) | ISBN 9781351267694 (Mobi/Kindle) | ISBN 9781138577138 | ISBN 9781138577138q (hardback :qalk. paper) | ISBN 9781351267724q (ebk)
Subjects: LCSH: Archaeology—Methodology. | Cartography.
Classification: LCC CC175 (ebook) | LCC CC175 .R46 2018 (print) | DDC 930.1—dc23
LC record available at https://lccn.loc.gov/2018006252

ISBN: 978-1-138-57713-8 (hbk)
ISBN: 978-1-351-26772-4 (ebk)

Typeset in Sabon
by Apex CoVantage, LLC

Contents

Acknowledgements vii
Contributors ix

1 On maps and mapping 1
MARK GILLINGS, PIRAYE HACIGÜZELLER AND GARY LOCK

PART 1
Where do maps come from and what do they do? 17

2 The map as assemblage: landscape archaeology and mapwork 19
OSCAR ALDRED AND GAVIN LUCAS

3 Cults of the distribution map: geography, utopia and the making of modern archaeology 37
HELEN WICKSTEAD

4 Feminist mapping for archaeologists: at the intersection of practices 73
SILVIA TOMÁŠKOVÁ

PART 2
Practices of mapping 95

5 The eye of the beholder: experience, encounter and objectivity in archaeo-topographical survey 97
MICHAEL FRADLEY

6 The craft of earthwork survey 117
TESSA POLLER

PART 3
Experimental mappings and cartographic provocations 141

7 Experimental mapping in archaeology: process, practice and archaeologies of the moment 143
DANIEL LEE

8 Here be worms: map art for the archaeologist (or how I learned to stop worrying and love artistic abstraction in maps) 177
ANDREW VALDEZ-TULLETT

9 Describing Hermion/Ermioni. Between Pausanias and digital maps, a topology Colour plate
CALEB LIGHTFOOT AND CHRISTOPHER WITMORE

10 Re-thinking the conversation: a geomythological deep map 201
ERIN KAVANAGH

11 Mapping sound: creating a static soundscape 231
DIANNE SCULLIN

PART 4
Digital transformations 265

12 Archaeology, digital cartography and the question of progress: the case of Çatalhöyük (Turkey) 267
PIRAYE HACIGÜZELLER

13 Cartography and quantum theory: in defence of distribution mapping 281
CHRISTOPHER GREEN

PART 5
When all is said and done 301

14 Making maps: a commentary 303
MONICA L. SMITH

Index 313

Acknowledgements

The chapters assembled in this book partially derive from papers presented at a day conference in May 2015 at the University of Leicester entitled ‘Archaeology and the Map: Critique and Practice’, and a dedicated session at the Theoretical Archaeology Group (TAG) conference at the University of Bradford in December of the same year. We would like to thank the University of Leicester and TAG2015 organisers for their kind support. Piraye Hacıgüzeller would like to thank Gerda Henkel Foundation (M4Human Programme) for their support for her postdoctoral project, “Archaeology and the map: from critique to practice” at the University of Oxford, which allowed her to carry out large part of the work that made this book possible.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Contributors

Oscar Aldred, Cambridge Archaeological Unit, Department of Archaeology & Anthropology (University of Cambridge)

Michael Fradley, School of Archaeology (University of Oxford)

Mark Gillings, School of Archaeology & Ancient History (University of Leicester)

Christopher Green, School of Archaeology (University of Oxford)

Piraye Hacıgüzeller, Department of Archaeology & Centre for Digital Humanities (Ghent University)

Erin Kavanagh, Faculty of Humanties and Performing Arts (University of Wales, Trinity Saint David)

Daniel Lee, University of the Highlands and Islands Archaeology Institute

Caleb Lightfoot, College of Architecture (Texas Tech University)

Gary Lock, Institute of Archaeology (University of Oxford)

Gavin Lucas, Department of Archaeology (University of Iceland)

Tessa Poller, School of Humanities (University of Glasgow)

Dianne Scullin, Independent Researcher

Monica L. Smith, Department of Anthropology (University of California, Los Angeles)

Silvia Tomášková, Department of Women's and Gender Studies, Department of Anthropology, UNC Chapel Hill

Andrew Valdez-Tullett, Research Group, Historic England.

Helen Wickstead, Faculty of Art, Design and Architecture, Kingston University, London

Christopher Witmore, Department of Classical & Modern Languages & Literatures, Texas Tech University

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

1 On maps and mapping

Mark Gillings, Piraye Hacıgüzeller and Gary Lock

Introduction

> "It is remarkable, given the necessity of maps for the work of archaeology, that so little has been written on what it is they *actually do* in the context of archaeological knowledge production."
>
> (Witmore 2013, 128; emphasis in original)

> "In what ways and with what effects have projection as a form of representation, accuracy as a measure of value, and correspondence as a yardstick of truth, come into being?"
>
> (Pickles 2004, 13)

This is a book about how archaeologists map, what they map and why they seek to map it. It is about the theoretical frameworks and craft traditions that underpin our established cartographic practices and the emergent assemblages of technologies, performances, desires and ways-of-doing that are giving rise to wholly new modes of mapping. From the very beginning of archaeological practice, maps (and plans) have been one of the discipline's most fundamental tools. The number, variety and prominence of maps in archaeology have been increasing further since the beginning of the 1990s due to the availability of a growing range of digital technologies used to collect, visualise, query, manipulate and analyse spatial data. This book was prompted by a nagging sense that despite such a fundamental reliance upon various forms of maps and mapping, and enthusiastic reception of ongoing digital transitions in cartographic practice, Archaeology has tended to feed off broader disciplinary critiques instead of helping to shape them. It has certainly taken a back seat in recent developments that have occurred within the Humanities and Social Sciences which, since the late 1980s, have prompted the emergence of an explicitly critical cartography within many disciplines, in particular Geography (cf. Crampton & Krygier 2006; Kitchin et al. 2009, 2011; Wood & Krygier 2009). Whilst much earlier critiques of mapping undoubtedly exist (Dodge et al. 2011, 2–7; Wood & Krygier 2009), "critical cartography" (or "critical mapping") distinguishes itself from these earlier approaches through its concentrated and 'self-conscious engagement with the fundamentals of cartographic thinking and behaviour' (Wood & Krygier 2009, 340), as well as the critical reception of maps themselves.

Among the major research interests that have shaped the multi-disciplinary field of critical mapping are cognitive mapping and cartographic aesthetics (e.g. Brewer et al. 1997; Lloyd 2000; Monmonier 1990; Nivala et al. 2008), the profound effects of new digital media and technologies on cartographic practices (e.g. Jensen and Cowen 1999; Pickles 1995a; Silver & Balmori 2003) and, perhaps most fundamentally, investigations into maps and power. In the late 1980s and early 1990s, studies within the last of these themes – which might be termed the "power of maps critique" – attempted to deconstruct Western mapping and lay bare its assumptions (e.g. Harley 1988, 1989, 1991; Wood 1992; Wood & Fels 1986). Later, this line of critique expanded in order to examine Western cartography's historical role in advancing colonialist, nationalist, militaristic and capitalist interests (e.g. Bassett 1994; Biggs 1999; Ramaswamy 2001; Winichakul 1994). Preoccupation with maps' power has also recently given way to practice-based re-conceptualisations of maps, referred to as "post-representational cartography" (cf. Caquard 2015; Kitchin 2010; 2014; Kitchin et al. 2009, 10–23; Rossetto 2015), and, more particularly, "performative and embodied mapping" (cf. Crampton 2009, 840–842; della Dora 2009; Perkins 2009).

Within archaeology, the power of maps critique and more particularly examinations of the political agency of Western mapping seem to have been highly influential, taking place most clearly in the 1990s as part of a broader critique of the political tenets of modernity. To name but a few of their more overt failings as powerful media, in these debates maps (and mapping) were seen as tainted by surveillance and voyeurism; inherently objectivist and unashamedly Cartesian; ocular-centric technologies of representation; specular, detached and analytical; irrevocably gendered and tied to militaristic and colonial undertakings (Thomas 2004; cf. Wheatley 2014, 118–121). Although often emerging from critiques that were themselves strongly anti-essentialist, it was as if modernity itself had a tenacious essence that was indelibly bound into the fabric of the map. With maps positioned as modernity's fifth column, it became straightforward to extend the critique to any approaches that foregrounded mapping and the handling and interpretation of cartographic data. This became most obvious in the case of technologies such as Geographical Information Systems (GIS). Similar concerns in Geography gave rise to the 'GIS and Society' debate which addressed "a deep concern for the impacts of unmediated technical practices on the discipline of geography and other arenas of social life" (Pickles 1995b, x; cf. Harvey et al. 2005; O'Sullivan, 2006; Sheppard 2005). Echoing this criticism, in archaeology GIS was branded one of the worst media to engage with in order to create knowledge about past human experiences (Tilley 2004, 218). A key consequence of this tendency to argue that the perceived failings of the map were even more concentrated and apparent in digital formats was that archaeological theorists largely excused themselves from key debates regarding digital cartography and the theoretical and practice-based consequences of the digital transition that were taking place elsewhere.

There was, however, an inherent tension in much of this power critique in archaeology, insofar as the most vocal proponents still found themselves relying extensively upon maps (e.g. Tilley 1994; Thomas 1996). Whilst this was evidently recognised and acknowledged (see for example Thomas 1994, 27, and the caption to his Figure 1.1), maps proved stubbornly difficult to excise. A further layer of complexity was introduced by the implicit suggestion that some forms of mapping were (again, in essence) more acceptable than others, such as counter-mapping (Brody 1981; Byrne 2008). This was presumably a consequence of the degree to which the concerns of modernity had been seen to shape them. Unfortunately, these broad generalisations about archaeological maps, so bent on rejecting them on the basis of their perceived oppressive power and relation to modernity, missed the point that maps are artefacts and as such have agential qualities that emerge only through contextual relations (Wood 2010a). Arguably, there is nothing inherently modernist about maps: maps are rendered as tools of modernity through their contingent entanglements with other things in particular contexts. Developing this further, maps, constituted as modern tools through a set of discursive practices, can also be constituted differently through alternative cartographic practices and emerging relations (Wood 2010a; see Butler 1988, 520). It may be argued that few disciplines other than archaeology could have made this point about context more strongly within critical cartography, given archaeology's vast and multifaceted experience with the enactments of artefacts. That has served as a key prompt for the current volume, which aims to rectify this situation by finally placing archaeology where it should have been for a very long time: right at the centre of the lively debates on the agency of maps and alternative mappings across the Humanities and Social Sciences.

Rethinking the archaeological map

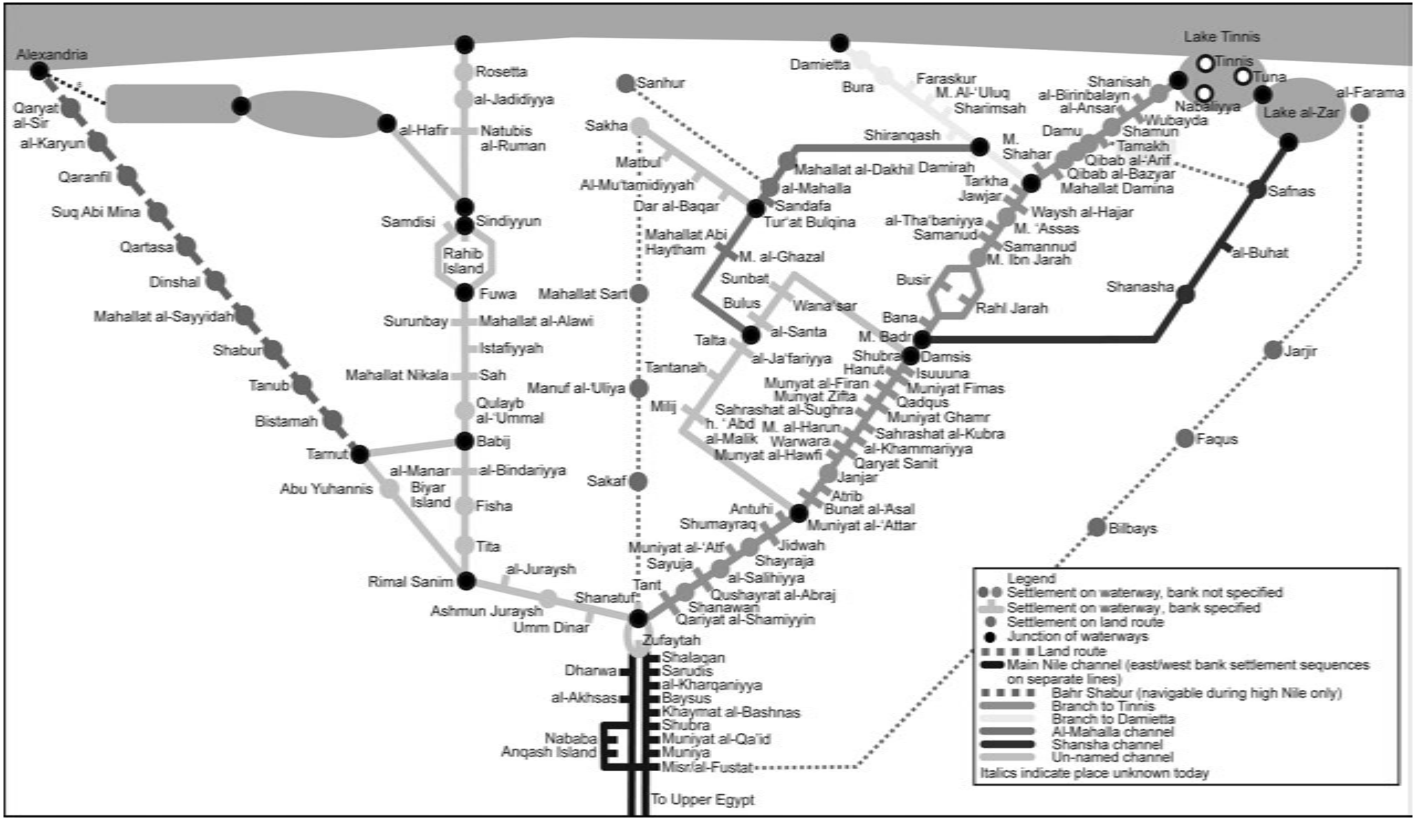
> "maps come to life when people start using them in a particular setting for a particular purpose . . . maps are not considered as ever finished, but as 'continually re-made every time someone engages with them'"
>
> (Caquard 2015, 229)

> "as things, maps gather"
>
> (Witmore 2013, 131)

It is important to stress that whilst the stridency of much of the negative reception sketched above silenced any sustained critical reflection on mapping, some archaeologists did begin to actively engage, with key themes and currents emerging from the developing critical and post-representational cartographic movements. Take, for example, their focus on practice and performance, and the ontological shift away from an unquestioned assumption of the *map-as-spatial-truth* to focus instead upon the *map-as-process* (cf. Crampton 2009; Caquard 2015; Kitchin & Dodge 2007; Perkins 2009). Drawing upon Latourian notions of the immutable mobile (Latour 1987, 223–227), much of this work has taken as its point of departure a concern not with what maps depict but instead what maps *do* in the context of knowledge production. For example, Witmore has argued that we need to see the map less as a representation and more as a thing, bound in a network of relations; a heterogeneous assemblage (Witmore 2013, 126–127). Proposing use of the term *mapwork* as a creative weaving together of the abstraction of the map with subject-centred perception, Webmoor has highlighted the way that maps have traditionally served as a powerful (and authoritative) medium through which an inevitably limited range of interpretations are negotiated. Instead, he proposes that we unsettle their assumed stability by treating them not as authoritative representations but instead as *mediations* (Webmoor 2005, 77). Building upon this notion of mediation, Lucas has stressed the value of treating maps first and foremost as "mediating devices" for bringing together and revealing assemblages that would be otherwise invisible to us (2012, 202). Shanks and Webmoor have gone on to stress the hybrid, prosthetic qualities of the map. Through the notion of a cyborg-ontology, they have drawn critical attention to the way that the map and map-user become woven together (and inseparable from one another) in the practices of navigation and way-finding (Shanks & Webmoor 2013, 104). Wickstead (2009), in turn, has examined how powerful political cartographic performances can take place within archaeological contexts, recounting how artist Janet Hodgson mapped the bodies of four male archaeologists leading a project at Stonehenge in order to create a hybrid monster using their virtual body parts. She named the monster Uber Archaeologist in a film based on the plot of the *Curse of Frankenstein*. The artist's creation and interactions with the Uber Archaeologist, a map of body parts, served to critically perform meanings in an archaeological context that in turn highlighted and laid bare the prevailing gender-related power relations in the discipline.

A second strand of cartographic research in archaeology has turned to the notion of the *deep map* (Heat Moon 1991), an engagement with place that draws simultaneously, and productively, upon the chorographic traditions of the 16th and 17th centuries (Mendyk 1986, 1989). A deep map is inherently post-representational insofar as it seeks to capture the essence of a place through what might best be thought of as a conversation or dialogue, and stands in stark opposition to the static representation of a traditional *thin map* (Harris 2015). Deep maps are creative and fluid, weaving together past and present, imagined and experienced, provocative and comforting, complementary and tensioned. "Reflecting eighteenth century antiquarian approaches to place, which included history, folklore, natural history and hearsay, the deep map attempts to record and represent the grain and patina of place through juxtapositions and interpenetrations of the historical and the contemporary, the political and the poetic, the discursive and the sensual; the conflation of oral testimony, anthology, memoir, biography, natural history and everything you might ever want to say about a place" (Pearson & Shanks 2001, 64–65). With its emphasis on unearthing and revealing unforeseen linkages between gobbets of information in order to weave together unexpected stories and spatial narratives, deep mapping is often associated with emergent multimedia developments in the digital humanities and GIScience (Bodenhamer et al. 2015; Roberts 2016; see below). That a technological basis for deep mapping is not essential, however, has been demonstrated by Pearson (2006), who has used performance to draw out the multi-scalar connections that exist between the scales of village, neighbourhood and region. His very title, *In Comes I*, trumpets the situated subjectivity of his approach rather than the detached objectivism of academia – "taking up the challenge to develop a non-representational style, in which there is no last word . . . meandering through time and across land, drawn to particular historical moments and topographic details as much by personal proclivity as academic obligation" (Pearson, 2006, 16).

A final, and more recent, strand takes the form of vigorous experimentation with the basic form of the map itself, allied to the first hints of a renewed theoretical dialogue with digital technologies, such as GIS. Take, for example, the important work of Fowler (2013) in seeking to develop wholly new ways of mapping complex relational assemblages (e.g. 2013, Figure 2.2). In a more playful, yet undeniably effective mode, Cooper has re-rendered historical maps of the Nile and its Delta using the design language of Harry Beck's iconic London Underground map in order to frame an investigation into the navigational landscape of the river (Cooper 2014, Appendix 1 Figures A1.1.–A1.7) (Figure 1.1). While co-ordinate systems provide the quantitative basis for GIS, our own biological and cultural navigation is more based on qualitative relationships, such as 'to the right of', 'in front of' and 'a little way past the supermarket'. This more relative approach to representing space and spatial relationships is illustrated by the complexities and opportunities of map making provided by the Parish Mapping Project of the environmental group Common Ground (www.commonground.org.uk; Crouch & Matless 1996; Clifford & King 1996). The importance of these maps in understanding place is based on the notion of 'local distinctiveness' and of what is important to people who live there and what they encounter in their daily lives that is important to them. Daniel Lee (2016) has experimented with such local archaeological knowledge within the Map Orkney Month project. Participants were asked to map their day and more specifically "sites" that they encounter using handheld GPS equipment as they carried out their everyday journeys, following their favourite paths as well as paths chosen specifically to reveal aspects of Orkney that were important to them. The focus of the project was not the maps per se, but the mapping processes through which people's local knowledge and their encounter with archaeological places and things were cherished. These mappings were



Alexandria
Qaryat al-Sir
al-Karyun
Qaranfil
Suq Abi Mina
Qartasa
Dinshal
Mahallat al-Sayyidah
Shabur
Tanub
Bistamah
Tamut
Abu Yuhannis
Rosetta
al-Jadidiyya
al-Hafir
Natubis
al-Ruman
Samdisi
Sindiyyun
Rahib Island
Fuwa
Surunbay
Mahallat al-Alawi
Istafiyyah
Mahallat Nikala
Sah
Qulayb al-'Ummal
Babij
al-Manar
al-Bindariyya
Biyar Island
Fisha
Tita
Rimal Sanim
al-Juraysh
Ashmun Juraysh
Shanatuf
Umm Dinar
Sanhur
Sakha
Matbul
Al-Mu'tamidiyyah
Dar al-Baqar
Mahallat Abi Haytham
Mahallat Sart
Manuf al-'Uliya
Sakaf
Tant
Zufaytah
Dharwa
al-Akhsas
Nababa
Anqash Island
Shalaqan
Sarudis
al-Kharqaniyya
Baysus
Khaymat al-Bashnas
Shubra
Muniyat al-Qa'id
Muniya
Misr/al-Fustat
To Upper Egypt
Damietta
Bura
Faraskur
M. Al-'Uluq
Sharimsah
Shiranqash
Mahallat al-Dakhil
Damirah
al-Mahalla
Sandafa
Tur'at Bulqina
M. al-Ghazal
Sunbat
Bulus
Wana'sar
al-Santa
Talta
al-Ja'fariyya
Tantanah
Milij
h. 'Abd al-Malik
M. al-Harun
Warwara
Munyat al-Hawfi
Sahrashat al-Sughra
Munyat al-Firan
Munyat Zifta
Hanut
Shubra
M. Badr
Bana
Busir
Rahl Jarah
Damsis
Isuuuna
Muniyat Fimas
Qadqus
Muniyat Ghamr
Sahrashat al-Kubra
al-Khammariyya
Qaryat Sanit
Janjar
Atrib
Bunat al-Asal
Muniyat al-'Attar
Antuhi
Shumayraq
Muniyat al-'Atf
Sayuja
Jidwah
Shayraja
al-Salihiyya
Qushayrat al-Abraj
Shanawan
Qariyat al-Shamiyyin
al-Tha'baniyya
Samanud
Waysh al-Hajar
M. 'Assas
Samannud
M. Ibn Jarah
Tarkha
Jawjar
M. Shahar
Damu
Shanisah
al-Birinbalayn
al-Ansar
Wubayda
Shamun
Tamakh
Qibab al-'Arif
Qibab al-Bazyar
Mahallat Damina
Lake Tinnis
Tinnis
Tuna
Nabaliyya
Lake al-Zar
al-Farama
Safnas
al-Buhat
Shanasha
Jarjir
Faqus
Bilbays
Legend
Settlement on waterway, bank not specified
Settlement on waterway, bank specified
Settlement on land route
Junction of waterways
Land route
Main Nile channel (east/west bank settlement sequences on separate lines)
Bahr Shabur (navigable during high Nile only)
Branch to Tinnis
Branch to Damietta
Al-Mahalla channel
Shansha channel
Un-named channel
Italics indicate place unknown today

Figure 1.1 Mind the Gap. "The Nile Delta, after al-Idrisi (1154)." (Cooper 2014, Figure A1.7, page 270)

clearly performances that not only challenged archaeological power structures by giving the power to map to non-specialist local people. By inclusion of imaginative sites in the project, these performances also successfully challenged well-established dichotomies within archaeology, such as objectivity and subjectivity, and fact and fiction (Lee 2016, 1–2).

Where might we go next?

> "This assumption of the transparency of the map – that it simply renders facts in graphic form – is significant and captures the tenacious assumption that maps should be regarded as scientific, rather than argumentative, documents"
>
> (Schulten 2011, 59)

We are fortunate to be writing at a time of particularly lively and productive theoretical debate in archaeology, as the impacts of the broader ontological turn, and emerging realist and new materialist agendas, begin to gain traction within the discipline (see Alberti et al. 2013; Olsen 2012; Thomas 2015; Witmore 2014). As a result, the time is ripe to revisit the archaeological map, both to respond more forcibly to the critiques of modernity that had served to stymie overt theoretical writing on mapping, as well as contribute productively to the momentum that has been generated by the innovative handful of critical studies that have taken place. As to the shape this might take, without wanting to be prescriptive, there are a number of themes that we feel could profitably be explored.

First, archaeological maps have an orthodox history, but is that their only history? If not, can we actively draw upon this hidden history; can it be subverted and/or co-opted, and what might the implications of such subversion be for archaeological mapping as practice and process? For example, how we map is shaped by careful rules and strictures – standards, guidelines and accepted ways-of-doing. Yet these techniques have a developmental history bound up with complex personal networks and agendas, what Bradley has characterised as 'craft traditions' (Bradley 1997), that can be unpacked and unpicked before being creatively refashioned. In this process of deconstruction and reconstruction, studying mapping ethnographies would prove to be a helpful approach where, as has happened in Geography (e.g. Brown & Laurier 2005; Del Casino & Hanna 2000), detailed accounts of what takes place during mapping practices may reveal the cartographic rules and strictures that otherwise lurk unseen.

Second, and linked closely to the above, our approach to mapping often seems wilfully oblivious to what it is that we are seeking to understand. For example, the self-same form of distribution map can be blithely used to encode the Iron Age 'Southwestern Culture' (Fox 1959, Figure 11), Roman Oxfordshire ware pottery (Jones & Mattingly 2002, Map 6:34), and fairies (Grinsell 1976, Figure 3). Looking in particular at the latter example, we can be confident that the stark black dots that litter the surface of the map do not mark the presence (or material traces) of these mythical beings. What they mark is stories, and rather than a simple spatial statement, they invite us to consider the host of relational capacities bound up in those stories: between people, animals, places, otherworldly entities, times, encounters, dreams, things, materials, memories etc. If that invitation is not readily apparent from the form of the distribution map, how could we map in order to make it so? That different approaches to annotating and coding our maps is possible is clear from projects such as the Psychogeographical Mark-up Language (PML) proposed by the activist Wilfried Hou Je Bek (O'Rourke 2013, 204; Hou Je Bek 2010). Yet, as a discipline we have been strangely reluctant to experiment with our cartographic schema.

Third, can we begin to use maps to not only represent, but also to navigate terrains that are as much speculative and imaginative as they are physical, and not solely through the vehicle of metaphor? For example, as archaeologists grow increasingly interested in questions of ontological alterity might we find ourselves turning once again to maps in order to begin to think our way into the unfamiliar terrains that are revealed to us (Alberti & Marshall 2009; Alberti et al. 2011; Viveiros de Castro 1998)? Take, for example, the collection of maps by artists, 'creative cartographers' and explorers assembled by Harmon. Revelling in the unfamiliar and the imagination these demonstrate vividly their creators' "willingness to venture beyond the boundaries of geography or convention" (2004, frontispiece).

Fourth, and following the psychogeographic mapping experiments carried out by the Situationists, how might we rethink the very practices of survey and mapping to encourage more provocative and challenging ways-of-doing in order to de-familiarise and reconfigure our understandings of seemingly familiar spaces and places (Debord 1956; Pinder 1996; Wood 2010b)? Take, for example, the experiment described by O'Rourke whereby two groups of psychogeographers explored part of the new town of Leidsche Rijn in the Netherlands, using maps of Rome. "After agreeing to meet forty-five minutes later on the 'Ponte Garibaldi' they set out to 'rewire their perception' of Leidsche Rijn" (O'Rourke 2013, 11).

Finally, even though archaeologists have already carried out interesting work with deep maps as discussed above, on-going developments in digital cartography are beginning to open even more, as yet unexplored, avenues that echo many of archaeology's more recent theoretical interests. Specifically, cartographic data visualisation in archaeology can be carried out with digital multimedia to fashion deep maps populated with narratives, videos, sound recordings, emotions, hopes, fears, pictures and personal and material biographies, as well as links to conventional archaeological databases and Big Datasets. Such "thick" (after Geertz 1973) cartographic presentations of archaeological sites would act as a continuous reminder that the identity of archaeological places, processes and pasts is not fixed but is something that is in a continuous state of becoming.

They would also provide unique possibilities for the querying, analysis and visualisation of archaeological Big Data (in real time), which can in turn inspire new questions and metaphors about archaeological processes and places as well as constructions and presentations of past realities. Examples of such archaeological Big Datasets would be continuous video recordings of locales where archaeological knowledge is produced, the output of self-recording digital devices (e.g. tablets) used during the archaeological process, the real-time logging of visitor routes through sensors, and social media postings about archaeological sites. Given that the core business of archaeological practice today still largely remains focused on seeking knowledge about the "archaeological past" – i.e. material things, concepts, beliefs, feelings, values etc. in use during the time period of interest – such digital deep archaeological maps would assist post-representational agendas in the discipline and serve to further destabilise ideas of, and hopes for, an independent past that can be known, understood and explained. After all, the past is not an existing code to be cracked or reality to be discovered. Rather, it is creatively constructed here and now through a set of relations presented together insofar as such presentations are found relevant and acceptable by consensus (see Rorty 1991). Deep archaeological maps in the digital era would serve to effect relatively recent aspirations in the discipline to creatively put forward new consensuses and metaphors to present and construct pasts, and carry out archaeological practices in ethically justified ways in order to render the world of today a better place to dwell in (see Harrison 2011; Witmore 2014).

This volume

It was in the spirit of the above that a day conference entitled 'Archaeology and the Map: Critique and Practice' was organised at the University of Leicester on 23 May 2015. This was complemented in December of the same year by a dedicated session at the Theoretical Archaeology Group (TAG) conference at the University of Bradford. The chapters assembled here derive from the papers presented at these meetings, alongside a number of invited contributions from a range of archaeological researchers whose work on maps and mapping we had found inspirational when designing the original conference sessions.

The initial prompt for the conferences came from the dawning realisation that the tensions, contradictions and frustrations with regard to archaeological mapping that we had each encountered in our own work were far from unique to our specific research areas. We all share an active concern with theory, field practice, and the role of mapping and have actively sought to combine these interests through digital cartographic approaches, such as GIS. The ideas that not only are more theoretically informed applications of mapping technologies possible, but that emerging practices and engagements with such technology can also lead to the creation of new and stimulating theory, have been a leitmotif of our published work (e.g. Gillings 1998, 2012; Hacıgüzeller 2012; Lock 2000, 2010).

Through this volume we hope to expand and extend existing trends in archaeological mapping theory as well as to facilitate the emergence of new trends. Specifically, the book invites archaeologists to experiment; whether through the fashioning of wholly new types of map (Lee, Lightfoot & Witmore, Scullin, Valdez-Tullett) or the deepening and inter-weaving of existing mapping and artistic practices (Kavanagh). It draws attention not only to the importance of practice (Poller, Fradley), but also the theoretical lenses that shape both the production, reception and consumption of our maps (Aldred and Lucas, Tomaskova). It stresses the importance of looking back at the complex histories that have shaped and fashioned our maps (Wickstead), as well as looking forward in order to encourage archaeologists to approach digital cartography both critically (Hacıgüzeller) and constructively (Green).

Conclusion

We would like to end this chapter with a challenge. Whether they are doggedly followed or roundly booed, manifestos offer a provocative and stimulating call to arms, so here is ours. Unashamedly non-/post-representational in nature (cf. Perkins 2009; Thrift 2008; Vannini 2015), we hope that it will provide a baseline for reading and pondering the chapters that follow.

1. **Maps are never stable and we continually need to question what a map is, as well as what the potential consequences are of its creation.**
   Maps keep changing in relation to our encounters with them (Kitchin & Dodge 2007) and, therefore, there can be no “stable map”. Leaving the security of treating maps as objective and accurate representations of reality for the sake of a continuous re-thinking of what a map is, may make us feel uncomfortable at first. Yet, the effort may well be worth it as an appreciation of maps that deprives them of their authority to represent the mapped thing for once and for all, may be the only way to fully realise their archaeological potential. In this new way of thinking, making maps becomes an ephemeral rendering of reality rather than the securing of a truth. A new encounter with the map results in the emergence of a new map making instance/performance, where the categories of “map-user” and “map maker” mesh and, more importantly, an urge appears to continually question what each encounter with a map entails in terms of constituting cartographic realities.
2. **Our maps have histories (and genealogies), and we need to understand these in all of their nuanced detail.**
   As discussed, maps do not come into being in a vacuum readily formed. Rather, they get constituted through practices, and their histories and genealogies play an important role in the process. That is, like any other human artefact, maps come into being contingently through

practices embedded in historical contexts and intellectual soil that allow them to take place. Therefore, we need to know about these histories and genealogies in all of their nuanced detail in order to understand how maps become varied agents and how they render reality. Such studies are frequently carried out for the case of Western mapping (e.g. Bassett 1994;Biggs 1999;Turnbull 1996), but what of non-Western histories and genealogies of mapping practices?

3 **How we map shapes what it is possible to do with the maps we create.** Maps facilitate action as much as they restrict it. This is to say that not every map will allow the same types of interaction to take place, and only certain types of engagement become possible, depending on the map's enacted qualities and content. For instance, a map that is argued to be strictly truthful to the mapped thing cannot be used as a media that facilitates multivocality. Rather, through its claim to be the mirror of the world, it silences any voice that may be considered to be challenging its trustworthiness. Therefore, we need to acknowledge that mapping is not simply putting lines on a piece of paper or screen that correspond to reality out there. Rather how, what, why and when we enact the map shapes what it is possible to do with the maps we create and what kind of actors and entities emerge as a result.

4 **Our maps can act and should be encouraged to do so. We need to accept that our maps can be affective as well as effective and must embrace their performative character.**

Cartographic realities are performative in the sense that they are real only to the extent that they are performed (see Butler 1988, 527). This does not only mean that cartographic realities are constituted by maps, but also that there is no pre-given quality to such realities. Instead, any part of cartographic reality is repetitively enacted through discursive practices entangled with maps. Therefore, we must embrace the idea that what we know about the spatiality of the world may be a consequence of the meanings we give to maps while interacting with them, rather than an expression of a fixed cartographic reality. For instance, the spatiality of the world may not be as easily measurable and calculable as Cartesian mapping practices make us believe. Rather, such a quality may be the consequence of the way in which we perform maps on the basis of a Western metaphysics. That is, if the surfaces of our maps were not reserved for Descartes's res extensa, i.e. the measurable "material stuff out of which the world is supposed to be made" (November et al. 2010, 591), and if the Western map was not presented as truthful to the world, would we still take the spatiality of the world we live in as measurable and calculable?

5 **There is nothing wrong with maps that are argumentative, discordant, disruptive, playful, provocative or simply beautiful.**

This is because we need to come to terms with the fact that the point of making/interacting with a map is asking new questions about the world and experimenting with the building of new relations. If novel connections and relations can only be built through argumentation, speculation, provocation or simple awe in front of beauty, then that is how it will have to be. Such a cartographic project definitely involves risks but if that is the price to be paid for thinking the previously unthought of in archaeology, then the risks are certainly well worth it (see alsoBailey 2014).

6 **There should be no limits on what is deemed mappable.**
Following the previous point, as long as we are no longer obsessed with creating accurate and objective maps that mirror the world, there can be no limits on what is deemed mappable. Accuracy and objectivity in Western mapping is typically obtained by drawing Descartes's measurable material world, his physical and fundamental reality formed by res extensa, on the map. Moving on from this preoccupation will open up a near-infinite set of possibilities for archaeological mapping. Maps then can become locales for presenting emotions, imaginations, ideas, arguments, suggestions and pleas.

References

Alberti, B., Fowles, S., Holbraad, M., Marshall, Y. and Witmore, C. 2011. "Worlds Otherwise" Archaeology, Anthropology, and Ontological Difference. *Current Anthropology* 52(6): 896–912.

Alberti, B., Jones, A.M. and Pollard, J. (Eds.). 2013. *Archaeology after Interpretation: Returning Materials to Archaeological Theory*. Walnut Creek: Left Coast Press.

Alberti, B. and Marshall, Y. 2009. Animating Archaeology: Local Theories and Conceptually Open-Ended Methodologies. *Cambridge Archaeological Journal* 19(3): 344–356.

Bailey, D. 2014. Art and Archaeology: Collaborations, Conservations, Criticisms. In I.A. Russell and A. Cochrane (Eds.). *Art and Archaeology: Collaborations, Conversations, Criticisms*: 231–250. New York: Springer.

Bassett, T.J. 1994. Cartography and Empire Building in Nineteenth-Century West Africa. *Geographical Review* 84(3): 316–335.

Biggs, M. 1999. Putting the State on the Map: Cartography, Territory, and European State Formation. *Comparative Studies in Society and History* 41(2): 374–405.

Bodenhamer, D., Corrigan, J. and Harris, T. (Eds.). 2015. *Deep Maps and Spatial Narratives*. Bloomington: University of Indiana Press.

Bradley, R. 1997. "To See is to have Seen" Craft Traditions in British Field Archaeology. In B. Molyneaux (Ed.). *The Cultural Life of Images: Visual Representation in Archaeology*: 62–72. London: Routledge.

Brewer, C.A., MacEachren, A.M., Pickle, L.W. and Herrmann, D. 1997. Mapping Mortality: Evaluating Color Schemes for Choropleth Maps. *Annals of the Association of American Geographers* 87(3): 411–438.

Brody, H. 1981. *Maps and Dreams*. Vancouver: Douglas & McIntyre Ltd.

Brown, B. and Laurier, E. 2005. Maps and Journeys: An Ethno-Methodological Investigation. *Cartographica: The International Journal for Geographic Information and Geovisualization* 40: 17–33.

Butler, J. 1988. Performative Acts and Gender Constitution: An Essay in Phenomenology and Feminist Theory. *Theatre Journal* 40(4): 519–531.

Byrne, D. 2008. Counter-Mapping in the Archaeological Landscape. In B. David and J. Thomas (Eds.). *Handbook of Landscape Archaeology*: 609–616. Walnut Creek: Left Coast Press.

Caquard, S. 2015. Cartography III: A Post-Representational Perspective on Cognitive Cartography. *Progress in Human Geography* 39(2): 225–235.

Clifford, S. and King, A. 1996. *From Place to PLACE: Maps and Parish Mapping*. London: Common Ground.

Cooper, J.P. 2014. *The Medieval Nile: Route, Navigation, and Landscape in Islamic Egypt*. Cairo: AUC Press.

Crampton, J.W. 2009. Cartography: Performative, Participatory, Political. *Progress in Human Geography* 33(6): 840–848.

Crampton, J.W. and Krygier, J. 2006. An Introduction to Critical Cartography. *ACME: An International E-Journal for Critical Geographies* 4(1): 11–33.

Crouch, D. and Matless, D. 1996. Refiguring Geography: Parish Maps and Common Ground. *Transactions of the Institute of British Geographers* NS21: 236–255.

Debord, G. 1956. Theory of the Dérive. Les Lèvres Nues #9 (www.cddc.vt.edu/sionline/si/theory.html) (Accessed 3rd April 2017).

Del Casino, V.J. and Hanna, S.P. 2000. Representations and Identities in Tourism Map Spaces. *Progress in Human Geography* 24(1): 23–46.

della Dora, V. 2009. Performative Atlases: Memory, Materiality, and (Co-)Authorship. *Cartographica: The International Journal for Geographic Information and Geovisualization* 44(4): 240–255.

Dodge, M., Kitchin, R. and Perkins, C. 2011. Introductory Essay: Technologies of Mapping. In M. Dodge, R. Kitchin and C. Perkins (Eds.). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*: 116–121. West Sussex: Wiley-Blackwell.

Fowler, C. 2013. *The Emergent Past: A Relational Realist Archaeology of Early Bronze Age Mortuary Practices*. Oxford: Oxford University Press.

Fox, C. 1959. *The Personality of Britain*. Cardiff: National Museum of Wales.

Geertz, C. 1973. *The Interpretation of Cultures*. New York: Basic Books.

Gillings, M. 1998. Embracing Uncertainty and Challenging Dualism in the GIS-Based Study of a Palaeo Flood-Plain. *European Journal of Archaeology* 1(1): 117–144.

Gillings, M. 2012. Landscape Phenomenology, GIS and the Role of Affordance. *Journal of Archaeological Method and Theory* 19(4): 601–611.

Grinsell, L.V. 1976. *Folklore of Prehistoric Sites in Britain*. Devon: David & Charles.

Hacıgüzeller, P. 2012. GIS, Critique, Representation and Beyond. *Journal of Social Archaeology* 12(2): 245–263.

Harley, J.B. 1988. Maps, Knowledge, and Power. In D. Cosgrove and S. Daniels (Eds.). *The Iconography of Landscape*: 277–312. Cambridge: Cambridge University Press.

Harley, J.B. 1989. Deconstructing the Map. *Cartographica: The International Journal for Geographic Information and Geovisualization* 26(2): 1–20.

Harley, J.B. 1991. Can There Be a Cartographic Ethics? *Cartographic Perspectives* 10: 9–16.

Harmon, K. 2004. *You Are Here: Personal Geographies and Other Maps of the Imagination*. New York: Princeton Architectural Press.

Harris, T. 2015. Deep Geography-Deep Mapping: Spatial Storytelling and a Sense of Place. In D. Bodenhamer, J. Corrigan and T. Harris (Eds.). *Deep Maps and Spatial Narratives*: 28–53. Bloomington: University of Indiana Press.

Harrison, R. 2011. Surface Assemblages: Towards an Archaeology in and of the Present. *Archaeological Dialogues* 18(2): 141–161.

Harvey, F., Kwan, M.P. and Pavlovskaya, M. 2005. Introduction: Critical GIS. *Cartographica: The International Journal for Geographic Information and Geovisualization* 40(4): 1–4.

Heat Moon, W.L. 1991. *PrairyErth (a Deep Map)*. Boston: Houghton Mifflin.

Hou Je Bek, W. 2010. Cryptoforestry (http://cryptoforest.blogspot.co.uk/2010/11/psychogeographical-mark-up-language.html) (Accessed 3rd April 2017).

Jensen, J.R. and Cowen Dave, C. 1999. Remote Sensing of Urban/Suburban Infrastructure and Socio-Economic Attributes. *Photogrammetric Engineering & Remote Sensing* 65(5): 611–622.

Jones, B. and Mattingly, D. 2002. *An Atlas of Roman Britain*. Oxford: Oxbow Books.

Kitchin, R. 2010. Post-Representational Cartography. *Lo Squaderno* 15: 7–12.

Kitchin, R. 2014. From Mathematical to Post-Representational Understandings of Cartography: Forty Years of Mapping Theory and Praxis in Progress in Human Geography. *Progress in Human Geography* e-special 1–7. DOI: 10.1177/0309132514562946

Kitchin, R. and Dodge, M. 2007. Rethinking Maps. *Progress in Human Geography* 31(3): 331–344.

Kitchin, R., Dodge, M. and Perkins, C. 2011. Introductory Essay: Conceptualising Mapping. In M. Dodge, R. Kitchin and C. Perkins (Eds.). *The Map Reader: Theories of Mapping Practice and Cartographic Representation*: 2–7. West Sussex: Wiley-Blackwell.

Kitchin, R., Perkins, C. and Dodge, M. 2009. Thinking about Maps. In M. Dodge, R. Kitchin and C. Perkins (Eds.). *Rethinking Maps*: 1–25. London: Routledge.

Latour, B. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes: Open University Press.

Lee, D. 2016. Map Orkney Month: Imagining Archaeological Mappings. *Living Maps Review* 1(1): 1–25.

Lloyd, R. 2000. Understanding and Learning Maps. In R. Kitchin and S. Freundschuh (Eds.). *Cognitive Mapping: Past, Present and Future*: 84–107. London: Routledge.

Lock, G. 2000. *Beyond the Map: Archaeology and Spatial Technologies*. Amsterdam: IOS Press. NATO Science Series A, Vol. 321.

Lock, G. 2010. Representations of Space and Place in the Humanities. In D. Bodenhamer, J. Corrigan and T. Harris (Eds.). *The Spatial Humanities: GIS and the Future of Humanities Research*: 89–108. Bloomington: University of Indiana Press.

Lucas, G. 2012. *Understanding the Archaeological Record*. Cambridge: Cambridge University Press.

Mendyk, S.A.E. 1986. Early British Chorography. *Sixteenth Century Journal* 17(4): 459–481.

Mendyk, S.A.E. 1989. *"Speculum Britanniae": Regional Study, Antiquarianism, and Science in Britain to 1700*. Toronto: University of Toronto Press.

Monmonier, M. 1990. Strategies for the Visualization of Geographic Time-Series Data. *Cartographica: The International Journal for Geographic Information and Geovisualization* 27(1): 30–45.

Nivala, A.-M., Brewster, S. and Sarjakoski, T.L. 2008. Usability Evaluation of Web Mapping Sites. *The Cartographic Journal* 45(2): 129–138.

November, V., Camacho-Hübner, E. and Latour, B. 2010. Entering a Risky Territory: Space in the Age of Digital Navigation. *Environment and Planning D: Society and Space* 28(4): 581–599.

Olsen, B. 2012. Symmetrical Archaeology. In I. Hodder (Ed.). *Archaeological Theory Today* (2nd edition): 208–228. Cambridge: Polity Press.

O'Rourke, K. 2013. *Walking and Mapping: Artists as Cartographers*. Cambridge, MA: MIT Press.

O'Sullivan, D. 2006. Geographical Information Science: Critical GIS. *Progress in Human Geography* 30(6): 783–791.

Pearson, M. 2006. *"In Comes I": Performance, Memory and Landscape*. Exeter: University of Exeter Press.

Pearson, M. and Shanks, M. 2001. *Theatre/Archaeology*. London: Routledge.

Perkins, C. 2009. Performative and Embodied Mapping. In R. Kitchin and N. Thrift (Eds.). *International Encyclopaedia of Human Geography* (Vol. 8): 126–132. Oxford: Elsevier.

Pickles, J. 1995a. Representations in an Electronic Age: Geography, GIS, and Democracy. In J. Pickles (Ed.). *Ground Truth: The Social Implications of Geographic Information Systems*: 1–30. New York: The Guilford Press.

Pickles, J. 1995b. Preface. In J. Pickles (Ed.). *Ground Truth: The Social Implications of Geographic Information Systems*: xii–xiv. New York: The Guilford Press.

Pickles, J. 2004. *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.

Pinder, D. 1996. Subverting Cartography: The Situationists and Maps of the City. *Environment and Planning A* 28: 405–427.

Ramaswamy, S. 2001. Maps and Mother Goddesses in Modern India. *Imago Mundi* 53(1): 97–114.

Roberts, L. (Ed). 2016. Deep Mapping. *Humanities* Special Issue (www.mdpi.com/books/pdfview/book/201) (Accessed 3rd April 2017).

Rorty, R. 1991. *Objectivity, Relativism, and Truth: Philosophical Papers I*. Cambridge: Cambridge University Press.

Rossetto, T. 2015. Semantic Ruminations on "Post-Representational Cartography". *International Journal of Cartography* 1(2): 151–167.

Schulten, S. 2011. Thematic Cartography and the Study of American History. In S. Daniels, D. DeLyser, J.N. Entrikin and D. Richardson (Eds.). *Envisioning Landscapes, Making Worlds: Geography and the Humanities*: 55–61. London: Routledge.

Shanks, M. and Webmoor, T. 2013. A Political Economy of Visual Media in Archaeology. In S. Bonde and S. Houston (Eds.). *Re-Presenting the Past: Archaeology through Text and Image*: 85–108. Oxford: Oxbow.

Sheppard, E. 2005. Knowledge Production through Critical GIS: Genealogy and Prospects. *Cartographica: The International Journal for Geographic Information and Geovisualization* 40(4): 5–21.

Silver, M. and Balmori, D. (Eds.). 2003. *Mapping in the Age of Digital Media: The Yale Symposium*. West Sussex: Wiley-Academy.

Thomas, J. 1994. The Politics of Vision and the Archaeologies of Landscape. In B. Bender (Ed.). *Landscape Politics and Perspectives*: 19–48. London: Berg.

Thomas, J. 1996. *Time, Culture & Identity: An Interpretive Archaeology*. London: Routledge.

Thomas, J. 2004. *Archaeology & Modernity*. London: Routledge.

Thomas, J. 2015. The Future of Archaeological Theory. *Antiquity* 89(348): 1287–1296.

Thrift, N. 2008. *Non-Representational Theory: Space, Politics, Affect*. London: Routledge.

Tilley, C. 1994. *A Phenomenology of Landscape*. London: Berg.

Tilley, C. 2004. *The Materiality of Stone: Explorations in Landscape Phenomenology*. London: Berg.

Turnbull, D. 1996. Cartography and Science in Early Modern Europe: Mapping the Construction of Knowledge Spaces. *Imago Mundi* 48: 5–24.

Vannini, P. 2015. Non-Representational Research Methodologies: An Introduction. In P. Vannini (Ed.). *Non-Representational Methodologies: Re-Envisioning Research*: 1–18. London: Routledge.

Viveiros de Castro, E. 1998. Cosmological Deixis and Amerindian Perspectivism. *The Journal of the Royal Anthropological Institute* 4(3): 469–488.

Webmoor, T. 2005. Mediational Techniques and Conceptual Frameworks in Archaeology: A Model in "Mapwork" at Teotihuacán, Mexico. *Journal of Social Archaeology* 5(1): 52–84.

Wheatley, D. 2014. Connecting Landscapes with Built Environments: Visibility Analysis, Scale and the Senses. In E. Paliou, U. Lieberwirth and S. Polla (Eds.). *Spatial Analysis and Social Spaces: Interdisciplinary Approaches to the Interpretation of Historic and Prehistoric Built Environments*: 115–134. Berlin: de Gruyter.

Wickstead, H. 2009. The Uber Archaeologist: Art, GIS and the Male Gaze Revisited. *Journal of Social Archaeology* 9(2): 249–271.

Winichakul, T. 1994. *Siam Mapped: A History of the Geo-Body of a Nation*. Honolulu: University of Hawai'i Press.

Witmore, C.L. 2013. The World on a Flat Surface: Maps from the Archaeology of Greece and Beyond. In S. Bonde and S. Houston (Eds.). *Re-Presenting the Past: Archaeology Through Text and Image*: 125–149. Oxford: Oxbow.

Witmore, C.L. 2014. Archaeology and the New Materialisms. *Journal of Contemporary Archaeology* 1: 203–246.

Wood, D. 1992. *The Power of Maps*. New York: Guilford Press.

Wood, D. 2010a. *Rethinking the Power of Maps*. New York: Guilford Press.

Wood, D. 2010b. Lynch Debord: About Two Psychogeographies. *Cartographica: The International Journal for Geographic Information and Geovisualization* 45(3): 185–199.

Wood, D. and Fels, J. 1986. Designs on Signs/Myth and Meaning in Maps. *Cartographica: The International Journal for Geographic Information and Geovisualization* 23(3): 54–103.

Wood, D. and Krygier, J. 2009. Critical Cartography. In R. Kitchin and N. Thrift (Eds.). *The International Encyclopaedia of Human Geography* (Vol. 2): 340–344. Oxford: Elsevier.

Part 1

Where do maps come from and what do they do?

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

2 The map as assemblage

Landscape archaeology and mapwork

Oscar Aldred and Gavin Lucas

Cartographic anxieties

Maps are an integral part of archaeology, especially landscape archaeology. As archaeologists, we use them, we annotate them, we even make them. Imagine conducting fieldwork without one. At the same time, they have not received much theoretical attention save for a negative reaction during the 1990s as phenomenology entered archaeology. Maps suddenly embodied a whole political ideology of modernist knowledge, the god-trick (Haraway 1991, p. 189) of a male gaze masquerading as the subjectless (i.e. objective) perspective (Rose 1993). This anxiety that surrounded the map (Pickles 2004) was most pronounced within phenomenological archaeology which largely developed within British post-processualism and was especially articulated through landscape studies. Julian Thomas gave it clear expression in a key paper (Thomas 1993), but it is Christopher Tilley who has perhaps carried its banner the longest and most steadfastly.

This new, phenomenological landscape archaeology sought to bring the landscape back down to the ground, to analyse it from the perspective of the human body, which meant dispensing with the map in its traditional form (see also Fleming 2006). This is evident in the way that Tilley has subsequently used maps, mainly to show the research history associated with places and landscape of a particular area, but also in showing distributions of sites or materials, as well as visual connections between sites, and added impressions illustrating directions and experiences. For example, the Dorset cursus (figures 5.15 and 5.20 (Tilley 1994, pp. 174, 185, respectively)); the sketch diagram of carved panels on Bak Vehammaren, Norway (figure 2.29 (Tilley 2008, p. 95)); the maps showing intervisibility between sites over topographic features around Stonehenge, the South Dorset Ridgeway, and southeast and northwest Bodmin Moor (e.g. figures 3.21, 5.18, 8.10 and 8.15 (Tilley 2010, pp. 96, 238, 377, 398)). But what these maps have that most other maps do not are traceable experiences of (kinetic) movement and (visual) perception between sites, as gauged through embodied practices.

However, there lies a deep irony in this phenomenological antipathy to and reconfiguration of the map, one we will return to later in the chapter.

Before we get there, we will trace a route through three arguments which attempt not only to tear down this antipathy but take us to a new understanding of the map in archaeology. At stake here are three questions: What is it that maps represent? What is that maps do? How do maps produce archaeological knowledge? In linking all three of these questions, we view maps through what might be called relational or more-than-representational thinking (Lorimer 2005; Thrift 2008). In describing maps as assemblages, we want to stress the way that maps intersect with archaeological practices and how this connects to archaeological knowledge, rather than think about them purely as representations. In exploring these questions, we will draw on moments in the history of British landscape archaeology as a way to ground our discussion in actual practices and debates. But we begin our journey in a rather unexpected place. The desert of the real.

The hyper-reality of the map

In what might be considered one of the paradigmatic texts of post-structuralism, *Simulacra and Simulation*, Baudrillard opens with a discussion of Borges story of the map which is as large as the territory it represents: a map at a scale of 1:1 (Borges 1975; Baudrillard 1994). For Baudrillard, this tale of the map covering the territory it depicts signified the superfluity of the actual territory. Whereas in Borges's tale, it was the map which soon frayed and decayed because of its uselessness, in Baudrillard it is the territory which slowly vanishes. His famous phrase 'the desert of the real' was coined to mark the emptiness of what lies behind the map, just as his concept of hyper-reality marked the absence of any separate reality behind signification. All that you will find is an endless chain of representations, the precession of simulacra. It is interesting to read Baudrillard in the wake of Latour's work in science studies and his ideas of translation and immutable mobiles (Latour 1987), because in many ways Latour could be seen to be saying the same thing – but in a mirrored world. If for Baudrillard, reality was constructed from a chain of significations, for Latour reality is constructed from a chain of material translations, as his study of soil science in the Amazon so eloquently demonstrates (Latour 1999, pp. 24–79). It is no coincidence that actor-network theory (hereafter ANT) has often been called a material semiotics (Law 2009; contra Rudy 2005). But we are not here to discuss the crypto-continuities between post-structuralism and ANT, but the way reality and representation merge in the case of the map and its territory.

This blurring actually has an old pedigree in British landscape archaeology, epitomized through the concept of the palimpsest: "The English landscape is a palimpsest, written upon again and again" (Hoskins 1966, p. 18, 1984, p. 59; the quote was first used by Crawford (1953, p. 51) though is not referenced by Hoskins in the text of this lecture) (Figure 2.1). This way of visualizing the landscape is caught up in a double map metaphor: the landscape as both *meaningful* text which can be read, but also as a *material* text

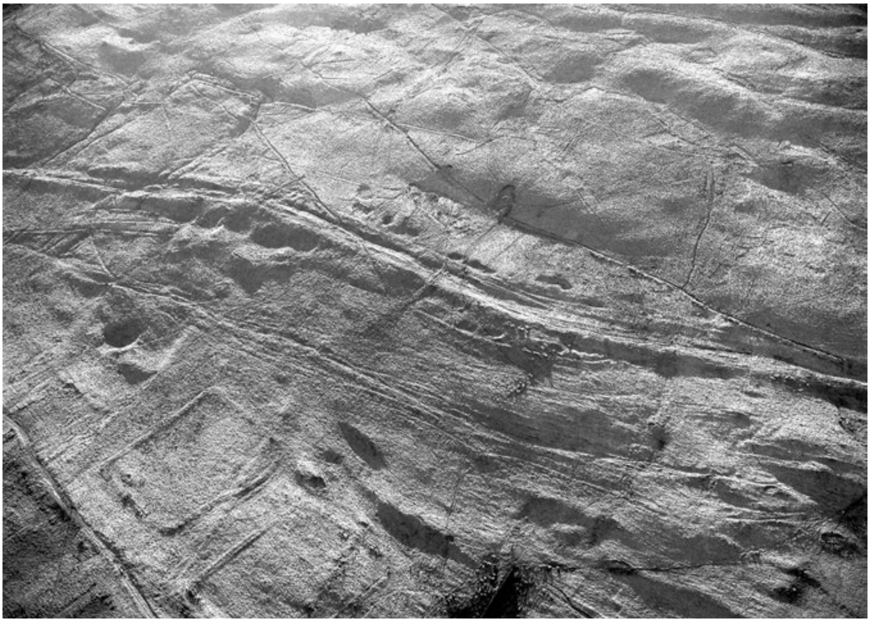


Figure 2.1 Crawford's conception of the palimpsest discussed in *Archaeology in the Field* (Crawford 1953, p. 58) based on the description of the system of routes near to Elvanfoot, S of Crawford, Dumfrieshire on the lower SE face of Annanshaw Brae (Canmore ID 72125). The aerial photograph is looking towards the W and shows convergences – spatially and temporally. There are two rectangular enclosures, unenclosed settlement platforms, quarries and multiple routes – tracks and roads, including a Roman road and 18th-century road (SC 359712 © Historic Environment Scotland).

which has been written and re-written multiple times. While it is clear what Crawford meant, as well as Hoskins, by reading the landscape from a map as if a text, Matthew Johnson has suggested that the palimpsest metaphor was too strong an idea for the way in which Crawford and Hoskins used it (Johnson 2007, p. 58). However, a lot hinges here on how one understands the concept of palimpsest, which for the contemporary reader may have closer associations with its use in the 1980s by Binford, Schiffer and others (Binford 1981; Schiffer 1985) than to how it was perceived by Hoskins in the early 20th century (Lucas 2012, pp. 115–120; also see Bailey 2007).

The palimpsest metaphor as used by archaeologists involves two distinct concerns or priorities: on the one hand, the formation processes associated with landscape, and on the other, what is produced as a result (Chadwick 2004, pp. 4–5; Aldred 2010, pp. 69–70; Lucas 2012, pp. 115–120). The discussion that focused around the palimpsest in the 1980s and which also engages time perspectivism today, attended to the processual qualities of the palimpsest – how easy is it to dissect in terms of the different processes behind its formation and at what temporal scale or resolution? In the early 20th century, the issues were quite different and rather focused on the palimpsest as a product of these processes. As a product of accumulation (and erasure), it is also easy to see how the landscape is like a map in the sense that what is seen is a totality (albeit encoded) of what is visible and has a surface presence. It regards the landscape in terms of contemporaneous features, in which the landscape is the contemporary product of the residues of material processes derived from multiple periods (time-depth), rather than a messed-up sequence where the archaeologist attempts to cordon off and hermetically seal different residues into different surfaces from the past to the present (e.g. time-slicing – as typically enforced by GIS technologies) (Lucas 2005, p. 44, fig 2.3).

This distinction between palimpsest as process and product is important as it speaks directly to the relation between landscape and mapping. The map and the palimpsest as *product* are intimately linked to one another, not just from the genealogical path that can be traced from the use of the metaphor by Maitland (in reference to the map; 1897, p. 14) to Randall (1934, p. 5) to Crawford (1953, pp. 51–59) and then Hoskins (1984, p. 59), but also from the way in which the metaphor mediates between the landscape and map in such a way as to blur the distinction between them. The palimpsest becomes a critical tool to show how time or history can be inscribed in both the landscape and the map in the same way. The early practice of British landscape archaeology involved considerable use of the map in conjunction with the landscape in which new observations and re-mappings were enrolled together in stimulating new connections. For example, the creation of the first archaeological maps by Crawford for the Ordnance Survey in 1920 (Crawford 1922, 1924) and Cyril Fox's use of the Ordnance Survey maps for his study on Cambridge dated to 1923 (Fox 1923). The association between the palimpsest metaphor and the map are more than just the shared accumulation of meanings and the textual metaphor of reading, but also in the way that the map's implicit connection with the landscape leads to it being understood as a contemporaneous assemblage; less a static record of a once-dynamic landscape, and more of a polychronic ensemble that nods to the past *and* to the future through the present.

Of course, one can argue that this concept of the palimpsest in early landscape studies was merely metaphorical – no real implication of a merging of the map and landscape was intended by it. If you were to ask Crawford, Fox and Hoskins today, they may even insist on such a separation. But it is not what they said (or thought) that interests us here so much as what they *did*. For their approach to landscape archaeology in many ways only re-affirms the blurred lines between the map and the landscape. To argue this, we need to move away from the representational function of the map, to its performative function. *What do maps do*?

Maps as tools

The genealogy of the map in landscape archaeology is an important history to follow because as the technologies of map-making have changed, redefining its terms of use and reliance, the map is pretty much still seen only as a representation of the world out there rather than as a tool. Importantly for the discussion in this paper, the map is both a representation *and* a tool (Ingold 2010). And in the context of both, it is a mediating object lying in-between moving bodies (i.e. map-users or map-makers) and the materiality of the landscape. In some ways the earliest uses of maps in landscape archaeology were already both representational *and* a way to conduct fieldwork, i.e. more-than-representational. For example, Crawford's use of maps as a means by which to locate sites when viewing them from the air; Cyril Fox's use of the map as a means of navigating and locating oneself and sites. Their maps were devices for conveying their research while also being firmly embedded in the examination of the archaeological landscape in attempting an interpretation of what was being observed. In the reproductions for publication, whether using Ordnance Survey maps or inked-up period maps of the Cambridge region, this duality seems to have been lost in contemporary archaeology, which focuses on maps in their representational role, at the expense of their performative potential. Thus, in this section, we would like to emphasise the way in which maps are made and used through fieldwork to shape the movements taking place during practice, and also through which these survey movements themselves have the potential to re-shape the map. The change from one definition to another between representation and tool as mediating device is traced via an argument that emphasises an alternative way to think about what maps *do*. Thus, it is along these lines that maps, movement and landscape in archaeological practice become thoroughly entangled.

One way to think about maps, then, is as a way of both guiding *and* representing movement. As representations, maps have had a long research history: "maps are *graphic representations* that facilitate a spatial understanding of things, concepts, conditions, processes or events in the human world" (cf. Harley and Woodward 1987, p. xvi our italics; Turnbull 1993, p. 3). As tools, maps are also used in perpetuating the accumulation of further understandings of 'space'; they are not limited to what is on the map but are part of a cognitive process of gaining familiarity with the world: a knowing while going along (after Ingold 2000, p. 231; de Certeau 1984). And what is more, maps are part of a carto*graphic* process either through a Cartesian ordering of space and events, in an objective and formal way, or in a more schematic manner of sketching, inherent in mental maps (e.g. Brody 1988). In this respect, there is a great deal of difference in the means by which the map as an object comes into being: through mapping, mapmaking and map-using in way-finding, cartography and navigation, respectively.

Essentially, the difference between these three practices is to do with the way that a map or the mapwork is used or produced. So, while the map can be arranged in such a way between different kinds of projects, as Ingold suggests, it is the way the way that all of these practices occur simultaneously, especially when a map is produced *and* used in both conventional and unconventional ways. This simultaneity is most profound when it occurs alongside movements of various kinds. For example, the material object of the map itself is a 'site' for further mappings, that extends the mapmaking, and its capacity as a navigation device; this recursive process is not so much a hermeneutic, but has a tool-like being (Harman 2002). In this respect, there is alignment between the different forces of movement that bring the map as an object into being, so to speak, from the fixed structural anchors that have a map-like quality in the landscape in which movement is part of a repeated and reiterative project (sites such as the propelling and pushing of movement that occurs with waymarkers along routes (cf. Aldred 2014a). It is these fluid mobilities coalesced into the map that are embodied, as it were, both in the hand, in the head and the map itself. It is an *assemblage* of materials and practices that involve all of these kinds of mapworkings (see Webmoor 2005).

In shifting the map away from the kind of categorisation that Ingold refers to, the map becomes several different kinds of things rather than exclusively one thing or another (after Latour 1999, pp. 66–67). Thus, a map is a construction by the labours of the people who make it and use it. It is a discovery in a form that is hidden but revealed through particular skill and understanding. It is an invention, because without the promise of fieldwork or its materialisation in practice, it does not appear. And finally, it is a convention, encoded and given symbolic value by us which without decoding would be just 'scribbles'. Maps are real and concrete objects, but they are also constantly being transformed through their use in the production of new renderings. In such a way, the map is also a means by which to follow and make traceable a series of paths. Furthermore, the map is also malleable, but an essential item in movement because it is a portable kind of knowledge system that can move from one place to another and along the paths, in the hand and in the head.

The map can therefore be considered as a type of embodiment, a means by which an object, cognition and locomotion all come into play at the same time through using and making maps. Thus, they are more than just a representation, but are an active participant in movement. They play an active role regardless of whether they are formally made as physical objects (i.e. pieces of paper with markings), or are situated in the embodied mind through the way that the bodily movement re-enacts landscape knowledge; a muscle memory. In drawing this connection between mental maps and physical maps, however, we would also suggest that a physical map can also be seen as a form of mental map, in the sense of extended cognition. The ideas connected to the work of scholars like Andy Clark and Ed Hutchins (Hutchins 1995; Clark 2003) have been already well rehearsed in archaeology (e.g. Knappett 2005; Malafouris 2013), so thinking of maps as extensions of the human mind – or rather the human body – offers a useful way to take the idea of maps as tools even further.

A map as a prosthetic is more actively constituted through action and experiment, in the foot-to-foot mapping of varying kinds of entities – the tracking of movement on a GPS, or the recording of survey points with which to relate to the record – but it is also part of a way of moving *on* and *along* the landscape, both as navigation and as wayfinding. These two often come to stand for particular modes of being in the world, whether seen from a distance as a map of post-survey work, or from actually being in the field, situated with the movements taking place during survey. Mapping paths of movement is not just a means to re-present fieldwork, but it is also a strategy to reveal movement in the field – its materialization. This occurs in two inter-related ways: by mapping already made sites, such as waymarker cairns or paths (materializ*ed* movement); and to document sets of movements that put this into effect (materializ*ing* movement) (Aldred 2014a, p. 11, 2014b, pp. 26–27). These two sets of materialization have consequences for interpreting movement which lies not in a textual hermeneutic (after Hodder 1992) but as a recursive relation *at* the interface between field intervention and representation, and underwrites the shift from abstract interpretation towards a practice-orientated perspective, (Figure 2.2).

Thus, the movements associated with archaeology itself emphasises an important relationality between the material and its practices (Lucas 2001, p. 198). There are obvious points of contact in a shared 'space' in which bodies that are separated by time begin to merge: the relationships between the movements that occur in the practice of doing archaeology begin to align with the interpretation of the material being recorded. What we mean in practical terms is that *walking* a beaten path, like the acts of *excavating* a pit or *deconstructing* a wall, reveals the shared 'space' not only between past *and* present (cf. Lucas 2001, pp. 202–204; Aldred 2014a, 2014b) but also between different bodies, as in Figure 2.2. Furthermore, this opens up the possibility of examining different kinds of movement, which are both structured *and* fluid. Or as Ingold might put it, of plotlines that follow by navigating points on a map already drawn, and, guidelines that create surfaces along which paths meander as a wayfinding strategy (Ingold 2007, pp. 155–170). This suggests to us at least that the mapwork associated with an archaeology of movement involves two elements:

1. Mapping the material record of previous movements from sites such as cairns and routes, as well as indirect places, which are constituted by but also constituting to further movements.
2. Documenting the practices of movement by the fieldworker as they occur during archaeological work.

The shared 'space' between these two elements, is critical to the study of movement itself (Aldred 2014a). There is an asymmetry in how this is attended

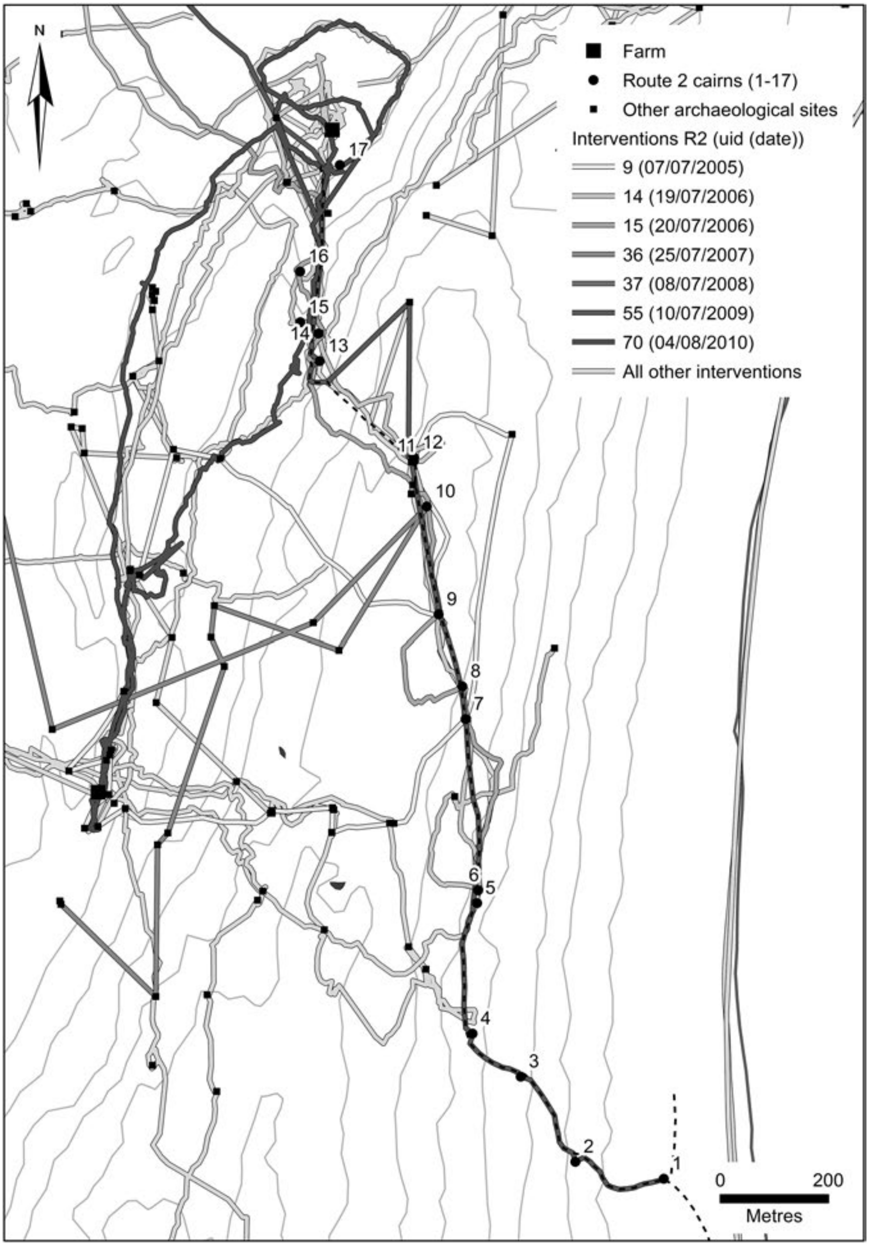

N
Farm
Route 2 cairns (1-17)
Other archaeological sites
Interventions R2 (uid (date))
9 (07/07/2005)
14 (19/07/2006)
15 (20/07/2006)
36 (25/07/2007)
37 (08/07/2008)
55 (10/07/2009)
70 (04/08/2010)
All other interventions
17
16
15
14
13
11
12
10
9
8
7
6
5
4
3
2
1
0
200
Metres

Figure 2.2 Map illustrating the duality of materialized/ing movements in the landscape of Vatnsfjörður, NW Iceland. The survey point as static and solid, materialized waymarker cairns constituting the materialized form of Route 2 (R2), but observed along fluid paths along which waymarkers and the route from multiple locations are materializing while moving through the landscape (based on Aldred 2014a, figure 9.6, p. 162).

to in contemporary archaeology, as the former tends to be included where the latter is excluded (also see Poller and Lee, this volume). Re-addressing this asymmetry in practice is related to a principle of symmetry whereby the main task is not to demonstrate the present as repetition of the past (or vice versa), but to emphasize how the materiality of the past is bound up with the materiality of the present (Bloor 1976; Shanks 2007). This again opens movement to other kinds of non- or more-than-representational themes (e.g. Thrift 2008), such as hybrid configurations, networks and rhythms (Latour 1987, 1999; Lefebvre 1991, 2004; Whatmore 2002; Edensor 2010). This opening up is part of a strategy of perceiving the material world and its practice in a non-reductive and creative way (e.g. Ingold 2000; Ingold and Vergunst 2008), particularly for movement which, by its very nature, tends to be reduced as it is 'captured' (cf. Solnit 2004; Aldred and Sekedat 2010).

Maps as media

Understanding maps as central to fieldwork and knowledge production in the way discussed in the last section, means we are now in a better place to appreciate the affirmative rather than negative aspects of maps as representations. Seeing a map as a prosthetic, as a form of extended cognition means also grasping that maps enable us to do things – to *see* things – we would not ordinarily be able to see. Fundamentally this connects the idea of a map with Marshall McLuhan's concept of media, as something which transforms our biologically given capacities, but also as something which we don't so much see as *see through* (McLuhan 1964). Like McLuhan's classic example of the light bulb as medium, its light-yielding capacities are what enable us to see in a dark room, so a map enables us to see the landscape in ways we could never have grasped by staying within the limits of our given body. Svetlana Alpers has made this point in connection with Dutch landscape panoramas and maps which both present to the eye those things which it would not ordinarily be able to see (Alpers 1989, p. 133). Just like the microscope, the map enables us to perceive new kinds of entities (such as cities) as wholes rather than as perspectival parts. But unlike the microscope (or telescope), instead of making the small appear large, or even the distant appear close, maps perform an inverse function: they make the close appear distant, the large appear small. In adopting the more generalized technology of map-making, archaeologists can see things they could not otherwise have seen (even if the converse is also true). Which brings us back to the god-trick with which we started this chapter.

We should never forget the ideological trappings that come with such god-tricks as the map; but nor should we forget their empowering potential. One of the important contributions that landscape archaeology gave to the discipline was enabled through maps. The map expanded archaeology's horizons towards the landscape by developing its spatial dimension, specifically by adopting the distribution map as a means to re-present material culture patterning. This was inspired partly from the settlement archaeology coming out of central Europe (e.g. Kossinna 1911) and its continuation (Kuna and Dreslerová 2007), but also the geography and history that was being developed in Britain by MacKinder and Maitland (MacKinder 1887; Maitland 1897). In particular, it was this adoption of a settlement archaeology approach to understanding the landscape that brought with it the map so as to represent the distribution of settlement, material culture and the flows of migrating people. This understanding also introduced the map as a device for a different way of seeing the landscape: from above and as a 'totality'. As a consequence, the map brought a greater appreciation of the entanglements between landscape, settlement, material culture and people which to some extent also applies to Crawford, Fox and Hoskins who made great use of viewing the landscape and the patterning of the archaeology/history of the land. As a result, new understandings were forged in the relations between space and time in a landscape setting; between ethnic groups, sites and the environment. For the most part, these relations were partially obscured while on the ground, or rather, they could not be comprehended fully. Thus, the map provided both a means of representing the potential totality of connections between sites and getting the message across about the completeness (or not) of the archaeological record (Figure 2.3).

While a map was a way of examining the complexity of landscape by situating multiple features together, it however also excluded the possibility of *terra incognita*, giving a misleading sense of completeness. While the map's potential to mislead (Monmonier 1996) about the extent of human activity in a landscape is somewhat problematic, more critically being aware of this also provides a means by which to examine these 'blank' areas more thoroughly. Utilising the properties of the map extended the means of enquiry concerning landscape by seeing the same material in different ways: on the ground and from above; or in the office and in the field; and the juxtaposition of multiple sources concerning the landscape and the archaeology contained within it.

But there is another story in here, especially concerning the use of historic maps by archaeologists, one which reveals a deep schism between prehistorians and archaeologists dealing with historic periods. In the first lecture that Harold Fox gave during the course he taught one of us (OA) on the MA in Landscape Studies at Leicester University in the 1990s called *Early medieval landscapes: English comparative studies*, it was suggested that to examine the 'texture' of the landscape one was to start with the earliest map. This did not have to be an accurate Cartesian map, just a representation. Complimentary to the landscape itself, the map provided the main entry point supplemented by other historical sources. Like Hoskins before him (Hoskins 1966, p. 17), there was a certain primacy in Harold Fox's understanding of landscape history that was derived from maps when used in relation to other sources. Whether this was related to examining field boundaries, patterns of fields, settlement patterns, patterns of lanes, extent of woodland and other land uses, the location of churches and the pattern of boundaries – it was the collective body

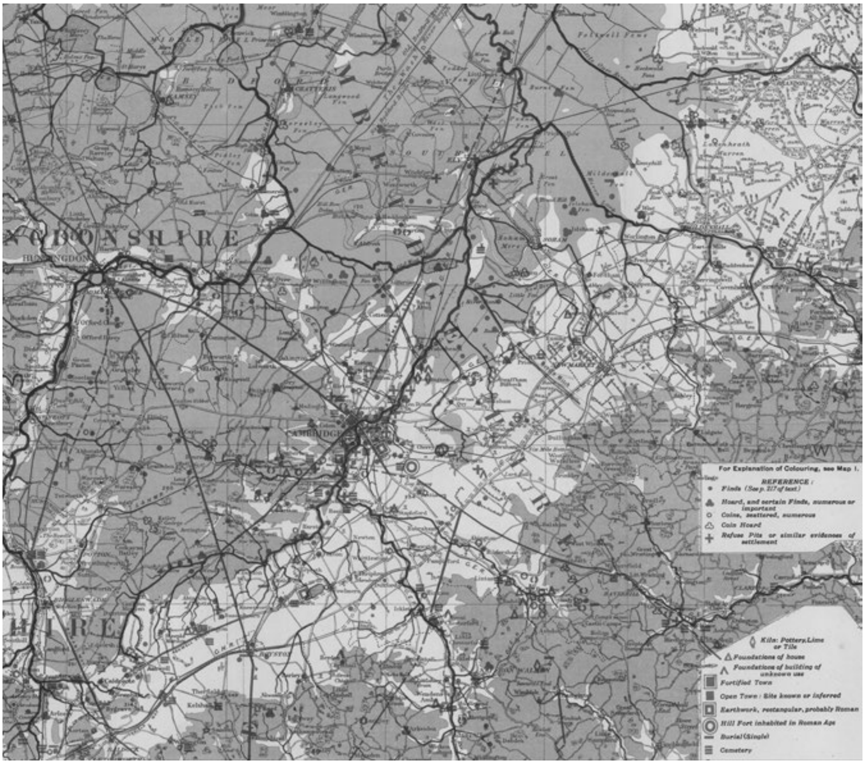

CAMBRIDGE
HUNTINGDON
For Explanation of Colouring, see Map I.
REFERENCE:
Finds (See p. 217 of text)
Hoard, and certain Finds, numerous or important
Coins, scattered, numerous
Coin Hoard
Refuse Pits or similar evidences of settlement
Kiln: Pottery, Lime or Tile
Foundations of house
Foundations of building of unknown use
Fortified Town
Open Town: Site known or inferred
Earthwork, rectangular, probably Roman
Hill Fort inhabited in Roman Age
Burial (Single)
Cemetery

Figure 2.3 A distribution map of Roman-period finds and sites within the Cambridge region, re-presenting material culture patterning (Fox 1923 Map IV – Find and Remains attributed to the ROMAN AGE: from 43 A.D to early V. Century A.D.) © Cambridge University Press.

which defined the topographies and textures of landscape. It is this sense of the map providing information that can be viewed alongside other information that we want to retain here, while also adhering to the view that this is situated within a recursive process, not one in which one source dominates others.

In examining the difference between the two traditions of landscape archaeology and landscape history as distinguished by Johnson, we would add to his division between prehistory and history (Johnson 2007, p. 58), a difference in the way in which the map is used to orientate landscape engagement. For landscape practitioners such as Fleming (1998); Aston (1985); and Taylor (1974), and those others considered by Johnson to be conducting landscape history, the map is used not only for illustrating research, but also as a historical source in order to examine the patterning and materiality of the landscape by noting continuity and change (e.g. through map regression or a comparison of historic and modern maps). In this way it provides a means of enquiry. In contrast the map does not inform questions and fieldwork in the same way for prehistoric archaeologists, such as Thomas (1993) and Tilley (1994), or at least it is not acknowledged as such in the quite specific way the landscape is engaged with through their practices. This is probably because as prehistorians, the map is not a source in the same way it is for archaeologists working on medieval and modern periods, where some maps can be contemporaneous with the remains being studied. It is precisely this difference which made those prehistoric archaeologists who were drawn to phenomenology miss what for scholars like Hoskins and Harold Fox were self-evident: maps are not purely representations of space so much as they are equally representations of time and history. Where Thomas and Tilley problematized maps as a spatial epistemology, Hoskins and Harold Fox saw them as embodying primarily historical qualities epitomized through the metaphor of the palimpsest, as discussed earlier in this chapter.

Because of this emphasis on a purely spatial epistemology, Tilley's alternative approach to landscape engagement uses a series of bodily dyads as a kind of semiotic language with which to give weight to a thick description of landscape. In particular, this kind of phenomenology is situated within an interpretative nexus involving a set of three terms: body, place and path (Tilley 1994, 2010, p. 486), the relationships between which are reproduced through a series of dialectical tensions. These terms are 'not considered as separate, but as dialectically related, as part of one another, while not being subsumed by any other' (Tilley 2010, p. 486). In practical terms, these set of relations are primarily situated within a 'phenomenological walk', which Tilley calls a 'walk of the walk' (2008, pp. 269–271): 'the kinetic activities of human beings orientate apprehension of the landscape and create it as human' (1994, p. 13); 'paths form an essential medium for the routing of social relations, connecting up spatial impressions with temporally inscribed memories' (1994, p. 31). Arguably, knowing where one is, is an essential means of conducting such an embodied archaeology. Tilley however, demands that this is done *without* a map. In other words, one should not retrace the experience of movement as if it is a map even though he argues that a journey along a path can be claimed to be a paradigmatic cultural act, since it is following the steps inscribed by others whose steps have worn a conduit or 'best way to go' (1994, p. 31); the map might not be in the hand but it is certainly inscribed into the landscape itself which is cognized through movement. At issue here is a rather narrow definition of what a map is under Tilley's perspective, whereas we would argue that Tilley's walking is itself a kind of mapping, revealing a kind of inner world (Ingold 2010, p. 20).

This phenomenological distrust in maps is tainted by a specific 'cartographic anxiety': that the map is understood *only* as a Cartesian representation of the world it describes, and is not thought about in terms of how they are made or used (cf. Pickles 2003). So while a map may orientate one towards certain interpretations of things, or bring one back to them, such as the spatial arrangement of sites, or the totality of a route, the map may also disorientate (Bender et al. 2007, p. 58; after Gell 1985). There are many other kinds of mappings to be had other than just making maps in a Cartesian way (e.g. Brody 1988; Corner 1999; Tuan 1977, pp. 48–49 fig. 4). This point would not have been laboured here had it not been for Tilley's own rhetorical argument. Tilley generalises *all* kinds of maps as geometric and Cartesian representations, going so far as to entirely dismiss any form of represented landscapes as being of any use at all for an investigation of past landscapes. Typically these representational forms are "texts, maps, photographs, paintings, or any computer-aided technologies, simulations, or statistical analyses"; Tilley then goes on to suggest that "studying landscapes through such representations can provide only a relatively superficial and abstract knowledge" (Tilley 2010, p. 26). While we agree that through such representations landscape can be made out to be 'superficial', and that 'there is no substitute for personal experience, for being there' (Tilley 2010, p. 26), the comprehension of what *being there* consists of is not limited *only* to a situated body. Maps go into the field too, not just people.

Thus, the way that maps have been understood in phenomenology is asymmetrical, falling between the production of the map and the use of it, not as an object to be used that helps to manipulate the human-scale perspective of being in the world. Phenomenology's rendering of the map in this respect is tainted as if it can *only* be part of a Cartesian perspective of the world, where it is seen only through its production as a representation of space, not of what information it contains or can contribute towards subverting the traditional two dimensional map into something else such as a counter mapping (Corner 1999; Byrne 2008). Again, as Harley suggests, the scientific and objective cartographic process is only one constitutive part of the map (2001).

Cartographic possibilities

Writing this paper in 2016, we have come a long away from the cartographic anxieties which beset many landscape archaeologists during the 1990s. At the same time, no doubt many more, if not the majority of archaeologists carried on their business as usual, not concerning themselves with the worries of a small group of British archaeologists. But ignoring the cartographic anxieties of people like Thomas and Tilley is a mistake; their reflexive concerns around the map should have stimulated us to think even more deeply about the status of maps in the production of archaeological knowledge and practice. What we have repeatedly emphasised is that maps are simultaneously devices through which action takes place, as well as representations of that action. They are assemblages. There can be a division, but we argue that maps are more useful in archaeology if they are considered as both: as tools and representational objects – in short, as *media*. In this chapter, we have tried to show this in relation to landscape archaeology and in particular, to stress how both map-making but more importantly perhaps, map-using, is a fundamental part of archaeological fieldwork and research. Using historical maps and performing techniques, like map regression, arguably helped to develop the idea of maps and the landscape as a palimpsest and with it a perspective on maps which is as much temporal as it is spatial. Using maps during landscape fieldwork reveals the critical role they play in mediating movement and, conversely, helps us to view maps as in some way embodying movement. Even sitting in our study, motionless, we can quite literally move through the landscape as we read the map. Once again, we see a temporality at play here which is supressed in purely representational perspectives. Finally, understanding that maps offer a way of seeing our world in a different way, or past worlds in a different way, means recognizing their qualities as instruments for unveiling objects and entities which are not visible at the scale of 'normal' human experience.

Although largely backgrounded throughout this paper, it is this aspect of time we want to foreground now, by way of a conclusion. Maps are considered quintessentially means of representing space – Cartesian or otherwise. But in pointing to the affinities a map has with the reality it depicts (palimpsests), the way it is used in fieldwork (mediating movement), and the way it reveals new things (temporal 'telescope') – all of these aspects suggest that we shift our attention away from the spatial and toward the temporal ontology of maps. Or perhaps more accurately, to consider maps as equally temporal as spatial things. While advances in computer modelling can enable us to develop maps with a temporal dimension (Fischer and Getis 2010; An et al. 2015), this is not what is being argued here, useful as such models are. Rather, even as static images, maps perform a temporality, both as history and as movement. The concept of the palimpsest which we discussed briefly earlier in this chapter surely needs more examination in relation to the map; it is potentially very fertile, theoretically speaking, but also perhaps limiting. What other ways can we think history, through the map? What new entities could be revealed if we did? Similarly, maps as wayfinders and navigation tools – as spatio-temporal devices – are important means to relate archaeology and movement, but how else might we envisage archaeologies of movement through maps? We offer these final questions in the spirit of a challenge, as further avenues of possible exploration for the cartographic future of our discipline.

References

Aldred, O. (2010). Time for Fluent Landscapes. In K. Benediktsson & K.A. Lund (Eds.), *Conversations with Landscapes* (pp. 59–78). London: Ashgate.

Aldred, O. (2014a). *An Archaeology of Movement: A Methodological Study*. Reykjavík: University of Iceland Press.

Aldred, O. (2014b). Past Movement, Tomorrow's Anchors. On the Relational Entanglements between Archaeological Mobilities. In J. Leary (Ed.), *Past Mobilities: Archaeological Approaches to Movement and Mobility* (pp. 21–47). London: Ashgate.

Aldred, O. & Sekedat, B. (2010). Moving on to Mobility: Archaeological Ambulations on the Mobile World: Part 1, Archaeolog. www.stanford.edu/dept/archaeology/cgi-bin/archaeolog/?p=311. Accessed 01/10/2016.

Alpers, S. (1989). *The Art of Describing: Dutch Art in the Seventeenth Century*. Harmondsworth: Penguin.

An, L., Tsou, M.-H., Crook, S., Chun, Y., Spitzberg, B., Gawron, J.M. & Gupta, D. (2015). Space-Time Analysis: Concepts, Quantitative Methods, and Future Directions. *Annals of the Association of American Geographers*, *105*(5), 891–914.

Aston, M. (1985). *Interpreting the Landscape: Landscape, Archaeology and Local History*. London: Routledge.

Bailey, G.N. (2007). Time Perspectives, Palimpsests and the Archaeology of Time. *Journal of Anthropological Archaeology*, *26*, 198–223.

Baudrillard, J. (1994). *Simulacra and Simulation*. Ann Arbor: University of Michigan Press.

Bender, B., Hamilton, S. & Tilley, C. (2007). *Stone Worlds: Narrative and Reflexivity in Landscape Archaeology*. Walnut Creek, CA: Left Coast Press.

Binford, L. (1981). Behavioural Archaeology and the 'Pompeii Premise'. *Journal of Anthropological Research*, *37*, 195–208.

Bloor, D. (1976). *Knowledge and Social Imagery*. Chicago: University of Chicago Press.

Borges, J.L. (1975). *A Universal History of Infamy*. Translated by Norman Thomas de Giovanni. London: Penguin Books.

Brody, H. (1988). *Maps and Dreams: Indians and the British Columbia Frontier*. Toronto: Douglas and McIntyre.

Byrne, D. (2008). Counter-Mapping in the Archaeological Landscape. In B. David & J. Thomas (Eds.), *Handbook of Landscape Archaeology* (pp. 609–616). Walnut Creek, CA: Left Coast Press.

Chadwick, A.M. (Ed.). (2004). *Stories from the Landscape: Archaeologies of Inhabitation*. Oxford: British Archaeological Reports.

Clark, A. (2003). *Natural Born Cyborgs: Minds, Technologies and the Future of Human Intelligence*. Oxford: Oxford University Press.

Corner, J. (1999). The Agency of Mapping: Speculation, Critique and Invention. In D. Cosgrove (Ed.), *Mappings* (pp. 213–252). London: Reaktion Books.

Crawford, O.G.S. (1922). Archaeology and the Ordnance Survey. *The Geographical Journal*, *59*(4), 245–253.

Crawford, O.G.S. (1924). Notes on archaeological information incorporated in the ordnance survey maps. Part 2, The Long barrows and megaliths in the area covered by sheet 12 of the 1/4 inch map (Kent, Surrey and Sussex). (Ordnance Survey professional papers. New series; no.8). London: H. M. Stationery Office.

Crawford, O.G.S. (1953). *Archaeology in the Field*. London: Phoenix House.

de Certeau, M. (1984). *The Practice of Everyday Life*. Berkeley: University of California Press.

Edensor, T. (Ed.). (2010). *Geographies of Rhythm: Nature, Place, Mobilities and Bodies*. London: Ashgate.

Fischer, M. & Getis, A. (Eds.). (2010). *Handbook of Applied Spatial Analysis*. London: Springer.

Fleming, A. (1998). *Swaledale: Valley of the Wild River*. Edinburgh: Edinburgh University Press.

Fleming, A. (2006). Post-Processual Landscape Archaeology: A Critique. *Cambridge Archaeological Journal*, *16*(3), 267–280.

Fox, C. (1923). *The Archaeology of the Cambridge Region: A Topographical Study of the Bronze, Early Iron, Roman and Anglo-Saxon Ages, with an Introductory Note on the Neolithic Age*. Cambridge: Cambridge University Press.

Gell, A. (1985). How to Read a Map: Remarks on the Practical Logic of Navigation. *Man*, *20*(2), 271–286.

Haraway, D. (1991). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. In D. Harway (Ed.), *Simians, Cyborgs, and Women: The Reinvention of Nature* (pp. 183–201). London: Free Association Books.

Harley, J.B. (2001). *Essays in the History of Cartography*. Baltimore: John Hopkins University Press.

Harley, J.B. & Woodward, D. (1987). *Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean: The History of Cartography*. Volume 1. Chicago: University of Chicago Press.

Harman, G. (2002). *Tool-Being: Heidegger and the Metaphyics of Objects*. Chicago: Open Court.

Hodder, I. (1992). *Theory and Practice in Archaeology*. London: Routledge.

Hoskins, W.G. (1966). *English Local History, the Past and the Future: An Inaugural Lecture*. Delivered at the University of Leicester, 3rd March 1966. Leicester: Leicester University Press.

Hoskins, W.G. (1984). *The Making of the English Landscape*. 2nd edition (published in 1976). First published in 1955. London: Penguin.

Hutchins, E. (1995). *Cognition in the Wild*. Cambridge: MIT Press.

Ingold, T. (2000). *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. London: Routledge.

Ingold, T. (2007). *Lines: A Brief History*. London: Routledge.

Ingold, T. (2010). Ways of Mind-Walking. *Visual Studies*, *25*(1), 15–23.

Ingold, T. & Vergunst, J. (Eds.). (2008). *Ways of Walking: Ethnography and Practice on Foot*. London: Ashgate.

Johnson, M. (2007). *Ideas of Landscape*. Oxford: Blackwell.

Knappett, C. (2005). *Thinking through Material Culture: An Interdisciplinary Perspective*. Philadelphia: University of Pennsylvania Press.

Kossinna, G. (1911). *Die Herkunft der Germanen: zur Methode der Siedlungsarchäologie*. Würzburg: C. Kabitzsch.

Kuna, M. & Dreslerová, D. (2007). Landscape Archaeology and 'Community Areas' in the Archaeology of Central Europe. In D. Hicks, L. McAtackney & G. Fairclough (Eds.), *Envisioning Landscape: Situations and Standpoints in Archaeology and Heritage* (pp. 146–171). Walnut Creek, CA: Left Coast Press.

Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers through Society*. Milton Keynes: Open University Press.

Latour, B. (1999). *Pandora's Hope: Essays on the Reality of Science Studies*. Cambridge, MA: Harvard University Press.

Law, J. (2009). Actor Network Theory and Material Semiotics. In B.S. Turner (Ed.), *The New Blackwell Companion to Social Theory* (pp. 141–158). Oxford: Blackwell.

Lefebvre, H. (1991). *The Production of Space*. Oxford: Blackwell.

Lefebvre, H. (2004). *Rhythmanalysis: Space, Time and Everyday Life*. London: Continuum.

Lorimer, H. (2005). Cultural Geography: The Busyness of Being More-Than-Representational. *Progress in Human Geography*, *29*(1), 83–94.

Lucas, G. (2001). *Critical Approaches to Fieldwork: Contemporary and Historical Archaeological Practice*. London: Routledge.

Lucas, G. (2005). *The Archaeology of Time*. London: Routledge.

Lucas, G. (2012). *Understanding the Archaeological Record*. Cambridge: Cambridge University Press.

MacKinder, H.J. (1887). On the Scope and Methods of Geography. *Proceedings of the Royal Geographical Society and Monthly Record of Geography*, *9*(3), 141–174.

Maitland, F.W. (1897). *Domesday Book and Beyond*. Cambridge: Cambridge University Press.

Malafouris, L. (2013). *How Things Shape the Mind: A Theory of Material Engagement*. Cambridge: MIT Press.

McLuhan, M. (1964). *Understanding Media*. London: Routledge and Kegan Paul.

Monmonier, M. (1996). *How to Lie with Maps*. 2nd edition. Chicago: Chicago University Press.

Pickles, J. (2003). *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.

Pickles, J. (2004). *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.

Randall, H.J. (1934). History in the Open Air. *Antiquity*, *8*, 5–23.

Rose, G. (1993). *Feminism & Geography: The Limits of Geographical Knowledge*. Cambridge: Polity Press.

Rudy, A.P. (2005). On ANT and Relational Materialisms. *Capitalism Nature Socialism*, *16*(4), 109–125.

Schiffer, M. (1985). Is There a 'Pompeii Premise' in Archaeology? *Journal of Anthropological Research*, *41*, 18–41.

Shanks, M. (2007). Symmetrical Archaeology. *World Archaeology*, *39*(4), 589–596.

Solnit, R. (2004). *River of Shadows: Eadweard Muybridge and the Technological Wild West*. London: Penguin.

Taylor, C.C. (1974). *Fieldwork in Medieval Archaeology*. London: Batsford.

Thomas, J. (1993). The Politics of Vision and the Archaeologies of Landscape. In B. Bender (Ed.), *Landscape: Politics and Perspectives* (pp. 19–48). Oxford: Berg.

Thrift, N. (2008). *Non-Representational Theory: Space, Politics, Affect*. London: Routledge.

Tilley, C. (1994). *A Phenomenology of Landscape: Places, Paths, and Monuments*. Oxford: Berg.

Tilley, C. (2008). *Body and Image: Explorations in Landscape Phenomenology 2*. Walnut Creek, CA: Left Coast Press.

Tilley, C. (2010). *Interpreting Landscapes: Explorations in Landscape Phenomenology 3*. Walnut Creek, CA: Left Coast Press.

Tuan, Y.-F. (1977). *Space and Place: The Perspective of Experience*. London: Arnold.

Turnbull, D. (1993). *Maps Are Territories Science is an Atlas: A Portfolio of Exhibits*. Chicago: University of Chicago Press.

Webmoor, T. (2005). Mediational Techniques and Conceptual Frameworks in Archaeology: A Model in 'Mapwork' at Teotihuacán, Mexico. *Journal of Social Archaeology*, *5*, 52–84.

Whatmore, S. (2002). *Hybrid Geographies: Natures, Cultures, Spaces*. London: Sage Publications.

3 Cults of the distribution map

Geography, utopia and the making of modern archaeology

Helen Wickstead

"We need maps"! O.G.S. Crawford announced, "maps of everything, in every text-book (whatever its subject) and in every monograph and scientific paper – not mere diagrams inserted into the text and only two or three inches in size, but real, large-scale maps with colours" (1922a: 99). Written in Holzminden Prison Camp – where maps were useful to escapees – Crawford's 'Man and His Past' was a manifesto for new approaches to the human past; a mission statement for the modernization of archaeology. And, for Crawford and many of his contemporaries, it was mapping that would effect this essential modernization.

In this chapter I explore how the activity of mapping became so important to the development of modern archaeology in Britain. I investigate how mapping became suffused with moral values and utopian politics, and how 'moral geographies' (Matless 1992, 1998) became harnessed to the production of a self-consciously modern archaeology over the course of the late-nineteenth and early-twentieth centuries. Mapping, I will show, was not just valued as a tool of data collection and analysis, but also positively valued as a performance in its own right, with the capacity to reform society and revitalize communities. Geography supplied approaches and theoretical predispositions that might allow a reformed and modernized archaeology to be placed in the service of the future.

My approach focuses on three figures whose work is central to the history of mapping in a formative period of archaeological map production in Britain – Herbert John Fleure, Harold Peake and O.G.S. Crawford. I have chosen these three individuals because of their profound influence on the developing meanings of mapping between the 1900s and 1920s; because of the way their map-work spans disciplines in the period before modern geography and archaeology acquired an established professional and institutional structure; and, because of the ways their map-work inter-relates, allowing me to explore some of the personal networks that made their work meaningful collectively in the early years of the twentieth century. The map-work of these three friends and collaborators is not only of interest to historians. The discursive contexts which made their mapping significant in their own times gave their map-work a formative role in the making of modern archaeology.

Thus, the meaning of their mappings, and the agency of their maps, continue to influence the performance of archaeological survey today.

The processes of disciplinary formation and professionalization in Archaeology have been studied for many years (e.g. Levine 1986; Stout 2008; Smith 2009). More recent research has investigated the significance of the visual in this process (e.g. Barber 2011; Perry 2013; Moshenska 2015). The contribution of maps and mapping to the processes of disciplinary formation, is, however, relatively underexplored. It is staggering that there is no up-to-date book-length history of mapping in archaeology, despite the enormous importance of archaeological survey in the construction of the modern discipline. This chapter ventures a small way along the path towards redressing this lacuna. My approach is not narrowly focused on what appears – to contemporary eyes – to be "archaeological". Instead I will look outside archaeology, to some wider intellectual forces that ultimately allowed scholars to identify certain problems, objects of study and methods as archaeological and to describe themselves as archaeologists within a modernized discipline.

I begin by introducing Fleure, Peake and Crawford and the wider circles within which their scholarship took place. The next section – 'The Cult of Kata' – explores the sociality of survey and the meanings of mapping within affective relations among friends and collaborators. I go on to examine the discursive contexts that gave mapping meaning in the early decades of the twentieth century, examining the politics of mapping and the role of Regional Geography in the modernization of archaeology. I then consider the role of archaeological survey in the production of 'citizen–geographers' among the populace at large. Exploring the meaning of survey in planning the future and the use of archaeological survey and popular archaeological maps in education and youth movements, I highlight some of the less-travelled by-ways of archaeological history that link archaeological maps and mapping to the history of public archaeology. As mapping became valued as a performance of moral virtue and proper citizenship, a socially engaged and modernized archaeology emerged. I conclude by reflecting on the legacies of this history of archaeology in the present and its potential applications to the project of rethinking archaeological maps and mappings.

Mapping networks: Fleure, Peake, Crawford

In 1916, Herbert John Fleure discovered seven men who he believed to be almost complete survivals of Palaeolithic Man, alive and well, and lost deep in the Welsh mountains. Isolated by their remote location from outside influences, these men were living fossils, inheriting characteristics that had long been diluted elsewhere. Reinforcing this startling discovery, Fleure and his colleague T.C. James produced a battery of statistical measurements on the physical anthropology of the Welsh. These figures were much more informative, Fleure argued, than the bald averages usually published in dull tabulations in the literature of the time. To cap it all, instead of producing a table of figures, Fleure and James presented their data in huge fold-out distribution maps, each of which groaned with information (see Figure 3.1).[1]

Mapping the distribution of "racial" characteristics was a major undertaking in the Edwardian era. Drawing up maps was the least of it, though this in itself was sometimes difficult given the relatively limited supply of maps and atlases (Freeman 1987). Fleure's work enlisted his students and necessitated the co-operation of people across large swathes of the country. Between 1905 and 1916 Fleure, James and their helpers surveyed and mapped 2,500 people, recording 19 of their physical features – including head shape and skin pigmentation (Fleure and James 1916; Gruffyd 1994). Constructing the map was a collective process involving the recruitment of allies and building networks.

The issue of networks is an important one. Historians of mapping have found it useful to understand cartography as emerging from networks of relations between people, places and things (e.g. Turnbull 2000; Pickles 2004). Archaeological mapping is particularly amenable to such an approach. Historically, the mapping of antiquities, and patronage of cartographers, was closely bound up with the governance of estates and the fortunes of land-owning dynasties (Sweet 2004). Those who governed

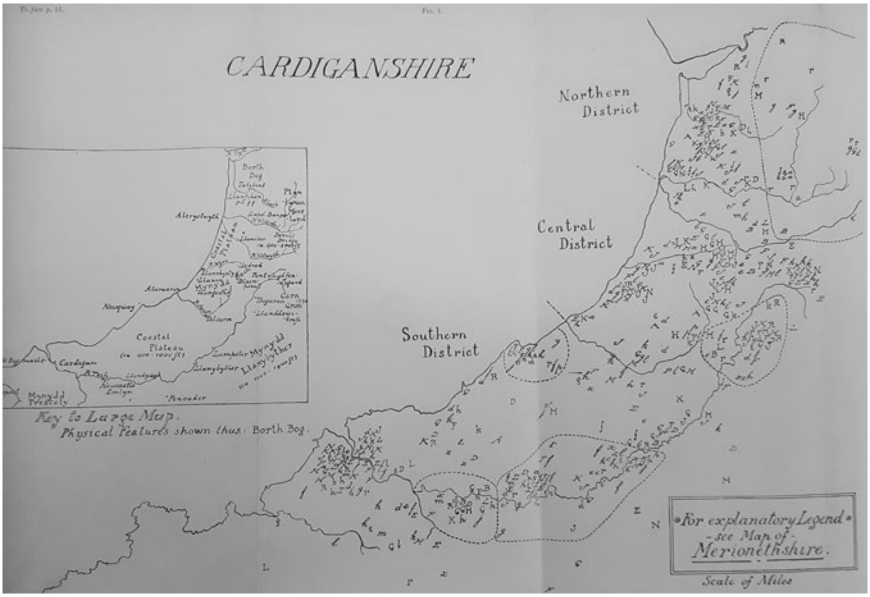

CARDIGANSHIRE
Northern District
Central District
Southern District
Key to Large Map.
Physical Features shown thus: Borth Bog
For explanatory Legend see Map of Merionethshire.
Scale of Miles

Figure 3.1 One of Fleure's early maps of racial characteristics showing data for Cardiganshire. Fleure's living Palaeoliths were a "nest of extreme dolichocephaly" with traces of a "negroid character" in the Plynlymon moorland on the west of the map. (Fleure and James, 1916).

estates developed expectations concerning the usefulness of cartography and value of antiquities that were exported across the British Empire (Harley 1989). Antiquarian mapping depended on networks of local informants; landowners who supplied access to information and places. Networks were not just developed for practical reasons but were also often connected to the processes through which scientific information was verified. In the era of the comparative method, deploying a wide range of "gentlemen" correspondents, supplied diverse lines of evidence whose independent (yet trust-worthy) origins reinforced trust in the minds of audiences. In the later-nineteenth century, scientific societies and individual scholars cultivated networks of on-the-ground informants recruited across the empire. These networks were especially vital to emerging Anthropology and Geography, which each aspired to a global, comparative, perspective. From 1854, the Royal Geographical Society's regularly updated 'Hints to Travellers: Scientific and General' detailed the kinds of observations gentlemen should collect, as well as outlined appropriate survey techniques and expedition equipment. The first edition included queries for the collection of information on "Ethnography" (e.g. Question 17: "What is their disposition? . . . Are they disposed to receive instruction?" (Raper and Fitzroy 1854: 356–357). The observations specified overlapped with earlier lists of queries that had been produced by the British Association for the Advancement of Science from 1839 (Urry 1972) and, later, with the Royal Anthropological Institute's 'Notes and Queries for Anthropology', which solicited communications from "Travellers and Residents in Uncivilized Lands". There was also considerable overlap between this type of survey and those initiated in Folklore and early Psychology, for example in the queries circulated through the Society of Psychical Research's 1894 "Census of Hallucinations" which collected around 50,000 responses from Europe and the USA (James 1895). The key point to emphasize is that in the late-nineteenth and early-twentieth centuries survey was a profoundly social activity, which built on information gathering networks. Mapping, in this period, was often, of necessity, participatory and collaborative.

By the middle of the twentieth century, Herbert John Fleure was "the acknowledged doyen of human geographers in the British Isles", with a reputation in Geography and Anthropology that was "truly worldwide" (Evans 1969: 484). He was Fellow of the Royal Society and had been president of the Geographical Association, the Association of University Teachers, the Folklore Society, the Manchester Literary and Philosophical Society, the Cambrian Archaeological Association, the Royal Anthropological Institute, and three different sections of the British Association for the Advancement of Science. At the time of his death in 1969 he was the author of at least 350 academic publications, and more than 700 reviews, not counting his other writing, such as his journalism for the *Manchester Guardian*. Today he is well known as one of the fore-fathers of modern geography (Evans 1969; James 1969; Gruffyd 1994, 1996, 2004).

Born in Guernsey, with a French mother, Fleure was bilingual, strongly influenced by the traditions and outlook of French geography, and a champion of regional minorities. At the time Fleure began his career, Geography was a nascent discipline, still in the process of institutionalization (Steel 1987a). Although widely taught in British schools, it was barely present in universities. Until the 1880s "there was not, anywhere in the United Kingdom a formally recognized department of geography with staff paid exclusively to teach that subject to students examined in it" (Withers 2000: 79). Fleure began teaching at Aberystwyth in 1903, and when he took up the newly bestowed Gregynog Chair there in 1917 he became one of a handful of men and women effectively responsible for inventing academic geography.[2] At Fleure's insistence the new Chair was in Geography *and Anthropology* – another subject being established within universities in the early decades of the twentieth century (Kuper 1996: chapter 1) – and much of his work would today be considered as belonging within the history of physical anthropology and archaeology as much as in Geography. After his early work in Zoology, Fleure spent many years analyzing and mapping the physical anthropology of 'racial' groups in Europe, especially in Wales (Fleure and James 1907; Fleure 1922; Davies and Fleure, 1958). He wrote widely on archaeology, providing specialist reports on excavated human skulls and excavating megaliths in the Channel Isles, Brittany, Wales and the Isle of Man (e.g. 1940, Fleure and Dunlop 1942). He also published in *Town Planning* (e.g. 1918a), *Folklore* (1932, 1948) and *Museology* (1915, 1946). Fleure's racial and eugenic science had a complex relationship to the mainstream racial prejudice of his times: the overlapping distributions of different indicators on his anthropological maps were an effort to reform racial science and avoid the racial prejudice he believed was inherent in the use of pre-given racial categories and statistical averages, yet his anthrometrics unavoidably continued the legacy of scientific racism, with mapped measurements including skin colour, "wooliness" of hair and skull shape (see Kushner 2008 for more on Fleure's race science). In the 1930s Fleure used his eminence to critique anti-Semitism and the Nazi "Nordic myth" (Hart 2013). He advocated a "positive eugenics" that deliberately sought to encourage biological diversity, especially by preserving "marginal" populations, and preferring the "vital betterment" of the breeding population to "artificial measures of legislation interfering with reproduction" (Fleure 1922: 102).

Fleure's seeming eclecticism largely results from our looking back at him from a present in which social science specialisms are relatively well established towards a past in which they were much more inter-related. Much of Fleure's writing supplied a commentary and critique on this specializing tendency, and was concerned with the potential remit and possibilities of geography as a common ground where science and the arts could interrelate (Campbell 1972).[3] If Fleure is best remembered as a geographer, this has more to do with his role in teaching, professional bodies and public engagement than with his published research. The rationale for the presence of

Geography, such as it was, in a small number of British universities in the first decades of the twentieth century might have ostensibly been for the benefits it offered to colonial administration and trade, but, in practice, it was more to support teaching in other disciplines (notably history and classics), and, perhaps above all, to satisfy the requirement that school teachers be educated in Geography. From 1904, the Board of Education required that all children in state secondary schools learn geography, a subject in which few teachers had honours at degree level (Steel 1987a). At Aberyswyth, Fleure's initial lectureship was in the Department of Education, where he soon set about establishing a Geography Summer School modeled on that led by his friend A.J. Herbertson at Oxford, and primarily training school teachers (Bowen 1987: 26–28). When Herbertson died young in 1915, Fleure succeeded him as Secretary of the Geographical Association, where he was also editor of the association's journal, *The Geographical Teacher*, a journal which "went to nearly every teacher in the secondary schools of Britain who taught geography at Higher (later Advanced) level" (Bowen 1987: 42). Opportunities for publication in geography were slight (the RGS's journal *The Geographical Review* was not predisposed towards the regional approach adopted by Fleure and many of his contemporaries; see below). Thus, Fleure was in a powerful position of leadership, not only with respect to academic geography, but also in directing the practices of geographical and mapping instruction carried out by educators across the empire and fostering the public image of Geography.

Fleure was "a persuader of considerable charm" who "gently almost confidentially" led his students, listeners and readers onwards (Freeman 1987: 12). His teaching style was personal and intimate – as one of his peers remarked; "there is no Department of Geography at Aberystwyth only a Personality" (cited in Bowen 1987: 41). Many of his students took up the archaeological dimensions of his interests, for example, the investigations of prehistoric megaliths undertaken by Cyril Daryll Forde (e.g. Daryll Forde 1929, 1930) and Emyr Estyn Evans (e.g. Evans et al. 1940[4]). Most of them, however, were destined for a career in school teaching, as were the majority of British Geography graduates at the time (Johnston 2011: 92). Their teaching ensured Fleure's views were widely disseminated, shaping the popular geographical imagination.

The second of our mapmakers is Harold John Edward Peake: "An authority of the first rank on the early history of mankind", "a man of rare gifts, possessed of the most acute and penetrating intellect . . . a trained observer and a remorseless analyst of humbug and pretentiousness" (Sharwood Smith 1935: 52). He was a member of the Council of the Society of Antiquaries of London, President and Huxley Medalist of the Royal Anthropological Institute, and President of the Anthropological Section of the British Association for the Advancement of Science (Fleure in Peake and Fleure 1956: v). He was also curator of the West Berkshire Museum in Newbury and, like Fleure, a keen educationalist, pursuing progressive educational policies as head of

Berkshire Education Committee and governor of Newbury Grammar School (Sharwood Smith 1935).

Peake's archaeology was bound up with his geographical interests and commitment to distribution mapping as the future of archaeological data gathering and interpretation. He began his archaeological career on the Committee of the Berkshire Victoria County History (VCH), producing its first report on ancient earthworks (Peake 1906). Nonetheless, he was critical of the VCH, espousing his own vision for how archaeological survey should be organized (Peake 1907–1908, 1912). The distribution map was crucial to what is perhaps today Peake's best known contribution to archaeology – the "prospector theory". This proposed that "elements of megalithic architecture", (initially, the dolmen, Peake 1916), had been spread by prospectors seeking precious commodities, including metal ores. The rudiments of megalithic religion spread initially from Syria into Egypt. From thence, prospectors travelled the world and into Northwest Europe, bringing the megalithic religion with them (Peake 1922b: chapter 4). Peake set up national 'databases' that could have verified his prospector theory. Under the auspices of the British Association for the Advancement of Science, he founded the National Bronze Age Implements Index and a Megalithic Index. Although the Megalithic Index has fallen into ruin (it was, for a spell, under the care of Egyptologist and Folklorist Margaret Murray), the Bronze Age Implements Index continues to be revised and studied (Wexler et al. 2015).

Peake and Fleure may have met through their mutual involvement in the Sociological Society, which assembled an eclectic range of thinkers and social reformers after 1903 (Scott and Bromley 2013). Letters from Peake's wife, Carli, to Crawford describe Peake, Fleure, and the sociologist and founder of the Sociological Society, Victor Branford, gathered at Peake's house in Boxford. In 1911 they were already working together and apparently "very pleased with their regional survey", "discussing writing propaganda about dividing England up into provinces".[5] Branford was a close collaborator with the "eutopian visionary" Patrick Geddes, who had a prominent and distinctive vision of geography's potential contribution to society (see below). A few years later, Peake and Fleure were both publishing in the society's journal, *The Sociological Review*, producing work which placed archaeological and anthropological survey at the service of ambitious schemes for devolution, social reconstruction and administrative reform (e.g. Peake 1919, 1922a). Peake and Fleure were soon to combine their interests in geography, anthropology and archaeology in a monumental archaeological project – the 10-volume *Corridors of Time* series – an overview of world prehistory from "the dawn of human life to the periods when written ideas and abstract thought spread far and wide" (Peake and Fleure 1927a, 1927b, 1927c, 1927d, 1928, 1929, 1931, 1933, 1936, 1956). Although the *Corridors of Time* is little cited today, in its own time it was "eagerly read" by geographers as well as archaeologists (Steel 1987b: 63).

The final member of our group is O.G.S. Crawford, who is widely recognized as an internationally significant figure in the history of archaeology. His work as founder and editor of *Antiquity*, Archaeology Officer of the Ordnance Survey, and pioneer of aerial archaeology continue to make him the subject of an extensive literature (more recent studies include Bowden 2001; Van Tilburg 2005; Hauser 2007, 2008; Barber 2016). Crawford may have met Harold Peake through Peake's work on the VCH, which coincided with Crawford's excavations at Bull's Copse Barrow. Peake was 20 years older than Crawford, and the surviving letters between them show Peake and his wife, Carli, attending to Crawford's well-being and career (Wickstead 2017), and it may well have been Peake who encouraged Crawford to switch from Greats to Geography while Crawford was at Oxford in 1908 (Hauser 2008: 9). The relationship was close and formative for both of them, and their letters reveal their shared purposes of reforming archaeology, politics and society by geographical means.

The Cult of Kata

Historians of archaeology are increasingly interested in how forms of sociality and networks have shaped the direction of the discipline (Díaz Andreu 2007; Thornton 2015). This approach is particularly useful in the context of nineteenth- and early-twentieth-century Britain, where life at all levels was distinguished by the burgeoning of clubs and societies (Harris 1994: 220). There is an extensive historical literature investigating how social networks, friendships and affective relations reproduced (sexually as well as socially) distinctions of class, culture and intellectual affiliation in this period (e.g. Annan 1955; Williams 1980; Kuper 2010). Having introduced the three individuals – Herbert John Fleure, Harold Peake and O. G. S. Crawford – I will now begin to explore how their mapping practices were related to aspects of their social lives during the 1910s and 1920s when amateur scholarship was still highly valued and archaeology still in the process of professionalization (Stout 2008).

Fleure, Peake and Crawford were all visitors to Peake's unusual and bohemian household at Boxford. By the accounts of other visitors, life at Boxford was "unconventional", offering a thrilling "glimpse of new, strange interests and people . . . entirely different from anything we had known hitherto" (Toye 1948: 115). The whole "new set of values" and "emancipation from convention" at Boxford made it a "second home" for many guests, in particular the young (ibid). "The house was a centre of light and learning . . . with its rehearsals for village plays and pageants, its many committees and charities" (Fleure in Peake and Fleure 1956: iii). Crawford was one of "many younger workers" who came "for refreshment from the wit and wisdom that was always generously at our disposal in walks up and down the beautiful garden or talks over the wood fire in the open hearth" (Peake and Fleure 1956: iii).

Among the more curious aspects of the Boxford circle was the creation of a joke religion – The Cult of Kata – probably the world's only example of a religion founded on the methods and findings of distribution mapping (Wickstead 2017). Letters between Carli Peake and Crawford name Crawford as "the founder of our religion", and imply that the Cult of Kata originated in a parody of his and Peake's theories concerning the distribution of places dedicated to St Catherine. Peake and the youthful Crawford believed megaliths tended to be found in places later dedicated to St Catherine, who was a disguised 'survival' of an earlier deity worshipped at these sites. For Fleure and Peake, the distribution of megaliths provided clues to the migration of prospectors and colonizers from the East (Peake 1922b; Fleure and Peake 1930). Crawford's early publications and unpublished manuscripts in his archive reveal he was engaged in mapping places linked to St Catherine and analyzing their distribution with respect to the sea, trade routes, megaliths and bronze implements (Crawford 1912, 1913).

"Pan-Katarics" staged by the Boxford circle (styled in the letters the "Kataric Circle") involved drinking a "low Punch" – an alcoholic variation on the High Tea – and reciting hymns, prayers, proverbs and other elements of liturgical poetry and performance; sometimes Kata would be invoked by lighting fires[6] or walking in circles. Megaliths were specially constructed, at least partly for the rites, in a "natural theatre" in woods near the Peakes' home where relocated sarsen stones were "used as an altar" (Toye 1948: 115–121) and at Saint-Jacut-de-la-Mer, a regular holiday location in Brittany. Some of the present-day place names at Saint-Jacut suspiciously invoke cult dogma (and it should perhaps come as no surprise that certain cult members were well connected with French cartographers). Apparently, the cult "invented place-names now so intertwined with the genuine, local names that a newcomer often cannot disentangle one from the other" (Toye 1948: 115–121).

The Kataric Circle shared social contacts with significant figures in culture and progressive politics, including editor of the influential *New Age* magazine, Alfred Orage, suffragettes Emmeline Pethick-Lawrence and Constance Lytton, and folk dance pioneer, Mary Neal (for more on the circle's feminist connections, see Wickstead 2017). The theatricality of Pan-Katarics was not coincidental. Some members had, or went onto, significant careers in the arts (e.g. Carli Peake, Geoffry and Francis Toye), while others had, or went onto, careers in Geography and Archaeology (e.g. Harold Peake, Richard Lowe Thompson,[7] Crawford). The writing and performance of a series of theatrical masques at Boxford by Carli Peake between 1905 and 1913 presented the Kataric Circle with further opportunities for social networking, drawing in celebrities including West End actress Ina Pelly and celebrity chef, author and restaurateur, Marcel Boulestin. The Cult of Kata could be seen as one of the more exotic manifestations of H. J. Fleure's ambition that geography act as the grounds on which arts and sciences might meet.[8]

The Cult of Kata was both a parody at the expense of archaeological survey and a social glue fusing friendships through which mapping networks could be extended. The Kataric Circle supplied field staff for Crawford and Peake's excavation at Botley Copse in 1910, (which letters described as a "Kataric Camp"). Members undertook "pilgrimages" – long walks during which they collected information for each other's survey and mapping projects (Sharwood Smith 1935: 32). "Pilgrimages" retraced the routes of Roman roads and reopened what were supposed to be the lost byways of old England. During such walks, Peake recreated processes of track-way formation he had observed among indigenous people in British Columbia (Hauser 2007: 114). Naming excursions "pilgrimages" was an occulting of archaeological survey methods, which letters represent as an act of devotion to Kata (Wickstead 2017). It may also have jokingly referenced the Woman's Suffrage Pilgrimages of 1913, when suffragists marched towards London along "eight of the great trunk roads" (the historic routes to the capital) towards a mass meeting at Hyde Park (Hustead Harper 1922: 738).

Traces survive of the close collaboration between archaeological mapmakers in Crawford's correspondence from this period.[9] It can also be found in the prefaces, dedications and footnotes of published surveys: J. P. Williams-Freeman's influential *Introduction to Field Archaeology* was dedicated: "To all those friends (or those who still remain the same), whom I have pressed into the service of visiting these camps, who have clambered up the heights and slid into the depths, who have struggled with the tape and suffered under the rods, who have often assumed the gait and sometimes the diet of the serpent, and above all, who have borne in silence (more or less), the inflictions of a man with a hobby" (such friends, included, of course, Peake and Crawford). Williams-Freeman did not discount the idea that St Catherine (whose name was attached to the hill-fort at the centre of Figure 3.2), might succeed "an old Celtic god of the hill-tops, who also had a wheel associated with his worship, and was the patron saint of travellers and seamen" (1915: 201–202).

The assortment of interests among the Boxford set is perhaps best represented by the personality of Robert Hippisley-Cox, who combined an interest in archaeological survey with running the theatrical restaurant Romano's – a famous thespian haunt on the Strand. Hippisley Cox's influential book *The Green Roads of England* (1914, Figure 3.3) went to six editions and embodied the Boxford circle's passion for "pilgrimages". The book aimed to recruit an army of amateur surveyors who would contribute information to *The Society of Green Roads, Lincoln's Inn Fields*, and compile an index of archaeological and geographical information (1914: 212).

The mapping of roads – especially Roman roads – had long been important in archaeological cartography. Maps of Roman roads were published in archaeological journals from the 1850s (e.g. Guest 1857). In the twentieth century, however, the rise of hobbies, including motoring, organized rambling, camping and youth movements, were to imbue roads with new significance, all the more so when they could be shown to be "ancient ways". The Ridgeway (an important routeway for Hippisley Cox, Figure 3.3), was soon represented as a prehistoric superhighway in numerous guides to "the Old

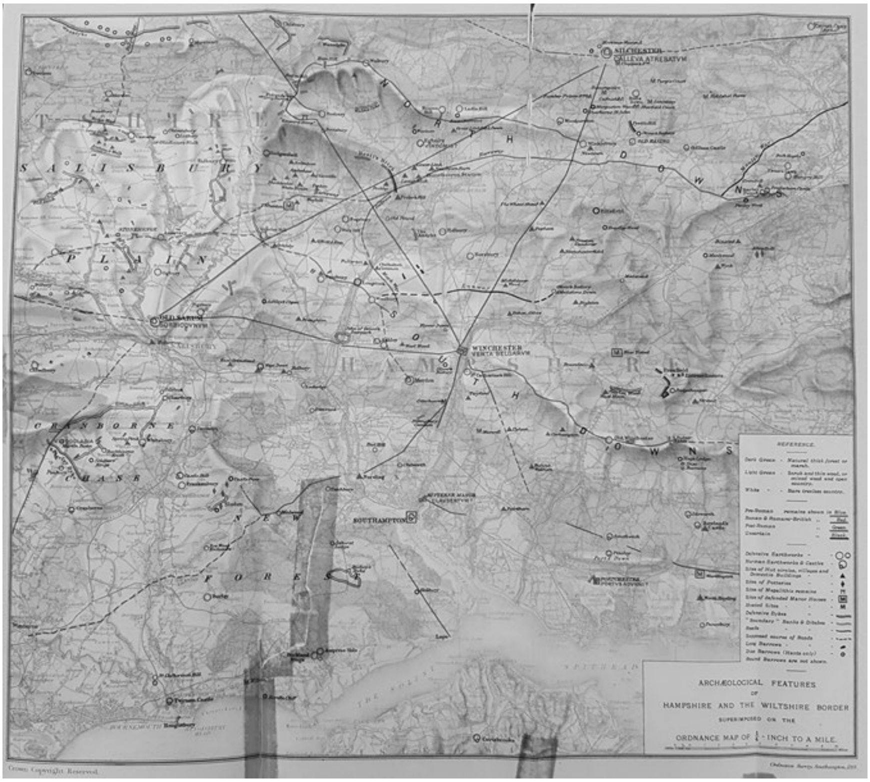

SILCHESTER
CALLEVA ATREBATVM
S A L I S B U R Y
P L A I N
WINCHESTER
VENTA BELGARVM
C R A N B O R N E
C H A S E
N E W
F O R E S T
SOUTHAMPTON
PORTCHESTER
REFERENCE.
ARCHÆOLOGICAL FEATURES
OF
HAMPSHIRE AND THE WILTSHIRE BORDER
SUPERIMPOSED ON THE
ORDNANCE MAP OF ¼-INCH TO A MILE.
Crown Copyright Reserved.

Figure 3.2 Fold-out map from Williams Freeman (1915) *Introduction to Field Archaeology* centred on St Catherine's Hill and based on the Ordnance Survey quarter-inch map sheet. Note the absence of gridlines and the use of different shades (in the original of green and white) to indicate swamp and forest, light woodland and open ground, respectively. "Open ground" suggested the areas considered most populous and, consequently, profitable for future investigation by a community of budding amateur field archaeologists.

Ways" (Matless 1998). In 1935, this "prehistoric green road" became the baseline for the Ordnance Survey's Retriangulation of Great Britain, furnishing the "Ridgeway Base", between White Horse Hill and Liddington Castle Hillfort. The Ridgeway Base was intended as the origin point for a network of trig pillars and the new National Grid.[10] With its abundant maps, line drawings, illustrated itineraries (including frequent mentions of public houses) and tips for motorists, *The Green Roads of England* was at the forefront of what was to become a popular craze for retracing the "old tracks" (Daniels 2006). It was publications like this, and Crawford's (1924) Ordnance Survey Map of Roman Britain (see below) that popularized the Cult of Kata's archaeological "pilgrimages" among a mass audience of 'citizen–geographers'.

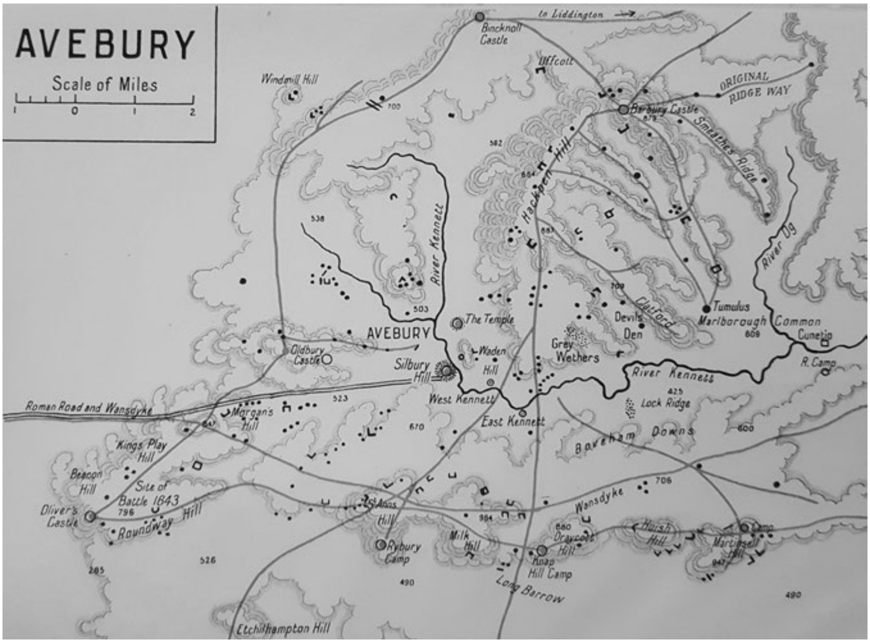

AVEBURY
Scale of Miles
1 0 1 2
to Liddington
Bincknoll Castle
Uffcott
Windmill Hill
ORIGINAL RIDGE WAY
Barbury Castle
Smeathes Ridge
Hackpen Hill
River Kennett
River Og
AVEBURY
The Temple
Devils Den
Clatford
Tumulus
Marlborough
Common
Cunetio
Grey Wethers
Oldbury Castle
Silbury Hill
Waden Hill
West Kennett
East Kennett
River Kennett
Lock Ridge
R. Camp
Roman Road and Wansdyke
Morgan's Hill
Kings Play Hill
Beacon Hill
Site of Battle 1843
Oliver's Castle
Roundway Hill
Boreham Downs
Wansdyke
St Anns Hill
Rybury Camp
Milk Hill
Knap Hill Camp
Draycott Hill
Huish Hill
Martinsell Hill
Camp
Long Barrow
Etchilhampton Hill

Figure 3.3 Map of Avebury from *The Green Roads of England* (Hippisley-Cox 1914: 1). Hippisley-Cox considered Avebury the central "seat of government" of a Neolithic society which once organized its communications along "green roads" following watersheds and marked by encampments. The "original" ridgeway is shown towards top-right.

Regional geography and the making of modern archaeological mapping

Towards the end of the nineteenth century, British explorers faced a crisis; the world appeared to have run out of new places to explore. "We are now near the end of the roll of great discoveries", announced Harold Mackinder. What was needed now, he argued, was not more expeditions, but more synthesis and analysis (1887: 141). Achieving this aim required the complete reinvention of Geography as it then existed, and its replacement with a "new Geography", an academic geography, to be created within universities. This new Geography would satisfy at once "the practical requirements of the statesman and the merchant, the theoretical requirements of the historian and the scientist, and the intellectual requirements of the teacher" (Mackinder 1887:159). In setting the agenda for a new, modernized, discipline, Mackinder was responding to a damning investigation exposing the parlous condition of British geography teaching (Wise 1986). British school children were learning geography as "mere memory work", it was reported. The root cause of the problem lay in the poor state of geography in British universities. Whereas Germany had 12 university chairs in Geography, Britain had only one chair (its occupant was Mackinder) (Clayton 2011: 58). The modernization of Geography was an urgent task facing an aging empire increasingly challenged by newer imperial powers (Clayton 2011: 52). Britain must change, urged Mackinder, or risk becoming "a corporate Alexander weeping because it has no more worlds to conquer" (Mackinder 1887: 141).

For the tiny band of professional geographers who took up Mackinder's challenge, the modernization of geography became an exciting enterprise conducted with missionary zeal; the task was immense, the stakes were high, and the potential almost unlimited, or so it seemed. Envisaging themselves as analysts as much as cartographers and explorers, the new Regional Geographers valorized relationality and synthetic understanding. Their discipline was founded on "the constant aim" of bringing out "the relations of the special subjects" and synthesizing systematically mapped information (Mackinder 1887: 145). Accordingly, many saw their discipline as the "science of distributions" (Herbertson 1905). And distribution mapping took on a special aura as a method that might lead to a new relational synthesis.

Regional geographers adopted the view that geography's distinct contribution was to act as an "omni-discipline" with the capacity to unify an intellectual landscape increasingly fragmenting into specialisms. It was the duty of geographers to build a bridge over the "abyss" that was opening between "the natural sciences and the study of humanity" (Mackinder 1887: 145). Geography would take on the mantle once worn by classics as "the common element in the culture of all men, a ground on which the specialists could meet" (ibid:160). The appeal of Geography, for the new synthesizers, was its role in the "grand project" of "keeping nature and culture in a united analytical (evolutionary) frame" (Clayton 2011: 61; Bowler 1983): "All modern schools of thought and criticism have . . . become so far geographical", announced Patrick Geddes, "since all are now agreed that not even the highest expressions of human individuality can be adequately studied apart from their physical conditions and antecedents of geographical environment, as well as of race and culture" (1898: 581). Geographically, nature and culture could be reunified and both could be analyzed as the outcome of evolutionary forces.[11]

Yet in all the excitement an inevitable problem crystallized: What was the new geography? If the "old" geography had been concerned to explore, describe and map the earth, how should a more analytical, synthetic and comparative new geography proceed? There was little agreement, and many early publications, including those by Fleure, were as concerned with debating the nature of geography as with conducting geographical research (Fleure 1918b; Campbell 1972).

One important question concerned environmental determinism; to what degree was human character and culture determined by physical conditions of climate, terrain and ecology? Debate around this question was often related to the accommodations different geographers produced between *systematic geography* – which presented the areal differentiation of particular characteristics, and *regional geography* – which established relationships between the results of systematic studies and identified the combination of features that gave each region its unique characteristics (Johnston 2011: 95). The regional approach had been developed in France by Paul Vidal de la Blanche and his followers and drew on a critical approach to environmental determinism that would come to be called "possibilism". Although the French regional school spent a lot of time systematically studying topography and the natural ecology and environment, Vidal's possibilism recognized human initiative as significant in how people related to their environments (Berdoulay 2011: 79). The concept of regional *genre de vie* was built of his identification of the multiple causes and effects which might produce a range of compromises between people and places. The human past, as revealed by a region's archaeological and historical features, was salient in the formation of *genre de vie* and the identification of regional traditions. Using this regional approach Vidalian geographer's sought to portray the "personality" of regions (Fleure 1921). Vidal's *Tableau de la Géographie de la France* (1908) and *Principes de géographie humaine* (1922; translated into English in 1926) were "widely read and praised, especially by Fleure"[12] (Freeman 1987: 15–16). An important aspect of Vidalian geography was its commitment to planning. The possibilist framework allowed geographers to identify what possibilities could be tapped for the future, giving geography a key role in economic and social development. Regionalists were thus committed to using their understanding of past and present to shape the coming era.

Regional geography was to become the defining feature of the British school. The region became "the central focus of the discipline's claimed niche within the sciences" (Johnston 2011: 95). At a time when the imperial powers were contending across a large part of the globe, discovering the correct way to define a region was not merely an academic exercise. Delimiting regions was commercially and politically significant. Lines drawn on maps were at issue in ongoing conflicts within the British Isles (as in the case of Ireland) and internationally the Scramble for Africa, the Boer War and the First World War focused the mind on the regional order. While the British state tended to prefer surveyors and cartographers to regional theorists, nonetheless the regional geographer Alan Grant Ogilvie was present in the British Delegation at Versailles as a member of the Geographical Section of the General Staff (Steel 1987a: 4).

In the aftermath of the First World War, regional geographers, including Vidal de la Blanche in France and Harold Peake and C.B. Fawcett in England, proposed schemes for the reorganization of their home countries (Peake 1919, see below). Regionalists were involved in debates about the subdivision of Germany; should this proceed systematically, dividing up the population into roughly equal units, or, more regionally, into a subdivision that took account of "ethnic conditions"?[13] Mackinder's (1902) discussion of the regional "heartland" of Europe as "The Geographical Pivot of

History" was based on mapping environmental conditions and historical conditions throughout time (in an analysis that shared much with archaeological regional studies). After the First World War, Mackinder's 'heartland theory' went on to become "one of the most influential theories in Western strategic thought", informing the geopolitical priorities of warring powers throughout the Second World War and into the Cold War (Venier 2004: 335). In the lethal geographies of the twentieth century, historical geography and archaeological distribution maps contributed to strategic decisions in which matters of life and death were weighed against regional interests.

Within the ongoing arguments concerning environmental determinism, much energy was spent debating the respective roles of nature and culture in defining the region. An early example was A.J. Herbertson's paper on 'The Major Natural Regions' (1905) that synthesized and analyzed the relations between several different variables in order to describe and categorize the entire surface of the earth.[14] Probably the most famous contribution of Fleure's early scholarship was to build a concept of "Human Regions" complementing Herbertson's Natural Regions, and countering his implicit environmental determinism (Fleure 1919a, 1919b). Coining a phrase in keeping with his proto-environmentalism, Fleure argued for a geography that took account of the alternative strategies used by human groups in pursuit of "the good life" (1919a). The earth's surface could be zoned based on the potential capacities different regions might offer for living the good life, and to this end Fleure categorized regions as "zones of increment", "zones of effort", "zones of difficulty" etc. (Figure 3.4). Fleure's 'human regions' were racially inflected (he compared aborgines and "pigmies" to species of Mollusca) and he was stricken over the problems of "zones of debilitation" where "degenerate" races were prone to exploitation by aggressive Europeans. Zones of difficulty and zones of effort, however, emerged as areas of dynamism, which built character into their peoples and preserved a vivid folk-life. Developments like hydro-electric power (Fleure was an enthusiastic proponent of renewable energy), meant zones of difficulty (for instance, Wales) might hold the key to future development. The least attractive were zones of industrialization in which "individualism" was destroying human flourishing.

Regional geography and Vidalian possibilism encouraged archaeologists to produce maps of past landscapes in which nature and culture were represented as separate and yet relatable layers. Mackinder's magisterial *Britain and the British Seas* compiled and compared available systematically collected data sets including those for terrain, geology, climate, sea routes and river systems. It proceeded to outline "racial" and "historical" geography, including a map of Roman Britain (1902: 196) before examining "Industrial England". Within regions, indicators such as soil type and topography were widely used to infer the locations of swamp, forest and mountainous areas and represent these as layers on maps superimposed with distributions of archaeological phenomena (for example, Figure 3.3, this paper). "Sea routes" (and therefore "lines of trade") as well as identifying potential

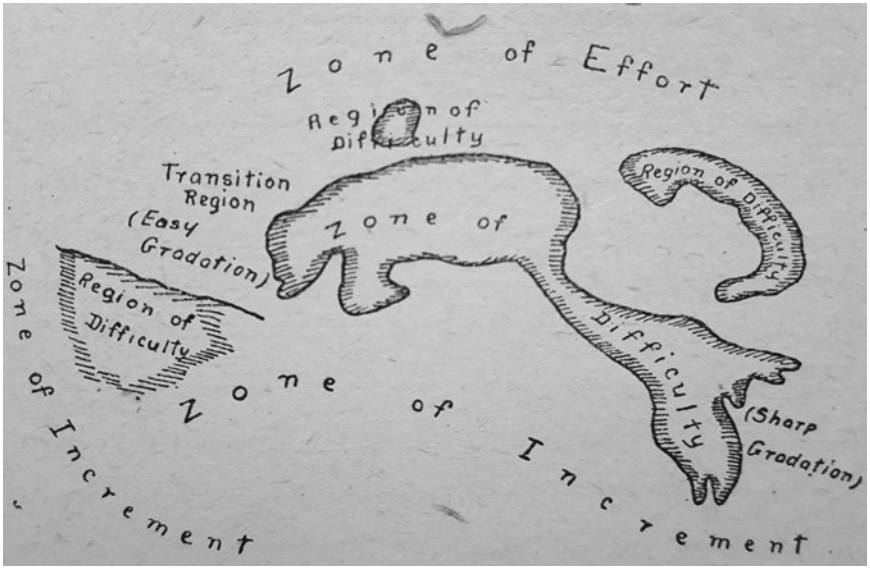


Figure 3.4 One of Fleure's diagrams showing the dynamics of his "human regions" in action in France (1919b: 29). Fleure's predilection for free-hand drawing reflects his disinterest in the "mathematical side" of geography; for regional geographers, geography was more than surveying and cartography; it offered forms of analysis and synthesis (footnote 3). Fleure's preference for free-hand drawing was inherited by his students and differentiated their output from Herbertson's Oxford school at which Crawford received a more technical cartographical training (Freeman 1987).

"ports of trade" were a significant feature of archaeological maps (e.g. Crawford 1912) and played a suggestive role in Peake's "prospector theory" (see above). Earlier work, such as that by geologist William Boyd Dawkins (1880), provided information on changing coastlines (see for example use of Boyd Dawkins in Fleure 1918b). Fleure's "Map of Primitive Britain", first produced in 1916, generalized the whole "habitable area of southern Britain in Neolithic time" (1918b: 291) seeking to reconstruct from soil and altitude data the areas of forest and swamp, and then determining the "open spaces capable of being occupied by primitive man" from a combination of environmental and archaeological datasets (Fleure and Whitehouse 1917: 87).

Crawford outlined a systematic methodology for "prehistoric geography" in the *Geographical Review* of 1922.[15] Prehistoric geography began with the "collection and classification of instances", moving onto the plotting of distributions on a map, and then their superimposition with geological and natural map layers in order to assess the "formations where the sites cluster" (1922b: 261–262). In this way, prehistoric geographers might "proceed to form some tentative generalizations" about prehistoric life. Like any good regionalist, Crawford's "prehistoric geographer" deployed maps to plan future actions. Hence, Crawford's last stage involved the use of mapping to "foretell" the locations of new sites (1922b: 261–262). "The study of distributions is one which is likely to attract a good deal of attention in the immediate future;" wrote Crawford "It is probable that most of the advances in archaeological knowledge will be made by geographical studies" (1922a: 132). The stages of distribution mapping have become so mainstream in archaeology today they seem almost commonsensical, yet they were, in their day, received as revolutionary developments, so much so that Crawford and others hesitated to label them archaeological and preferred to call them "prehistoric geography".

Inspired by Crawford, whom he cited as "a great influence", as well as by Fleure and Williams-Freeman, the recently demobilized Cyril Fox also began applying the techniques of regional geography to field archaeology.[16] Fox's *Archaeology of the Cambridge Region* took the radical step of defining a region based on environmental characteristics rather than on county boundaries (Fox 1947: 2–3). Like Williams-Freeman's maps (Figure 3.3), Fox's map of the Cambridge Region had three over-printings of different colours showing different vegetation coverage and was based on the Ordnance Survey quarter-inch series (Figure 3.6, below). By 1932, when Fox presented "The Personality of Britain" as a keynote address at the First International Congress of Prehistoric and Protohistoric Sciences, Vidalian regionalism had become recognizably archaeological, even if Fox's approach still appeared stunningly modern (A. Fox 2000: 67). Fox's colour plates (which were also exhibits at the National Museum of Wales) presented a map of physical and natural variations (Map B) which formed the background setting for his discussion of a range of distributions, including "antiquities of the Bronze Age", presented as a fold-out (Figure 3.5, Fox 1959). Fox's method drew heavily from regional geography, bringing together systematically organized areal distributions, examining their relations, and then using these to describe the regional character of different "zones". Fox's upland zone, in which isolated populations preserve traditional ways and rugged individuals are forced to engage in character-building efforts, recalls Fleure's observations concerning the "personality" of upland Wales (Fleure and James 1907; Fleure 1919a, cf Fox 1959).

If one condition had to be singled out as the most significant to the mapping revolution that modernized British archaeology, it would be the availability of one-inch and quarter-inch Ordnance Survey maps. "In no European country does field archaeology *exist* today", wrote Crawford, adding that Britain's pre-eminence in this sphere was "due to the existence of our large-scale O.S. maps and the marking of antiquities upon them" (1926: 67). The cost of producing the one-inch series began falling after 1892 when the Ordnance Survey finally stopped using laborious hand-tinted engravings and started to reproduce maps using lithography

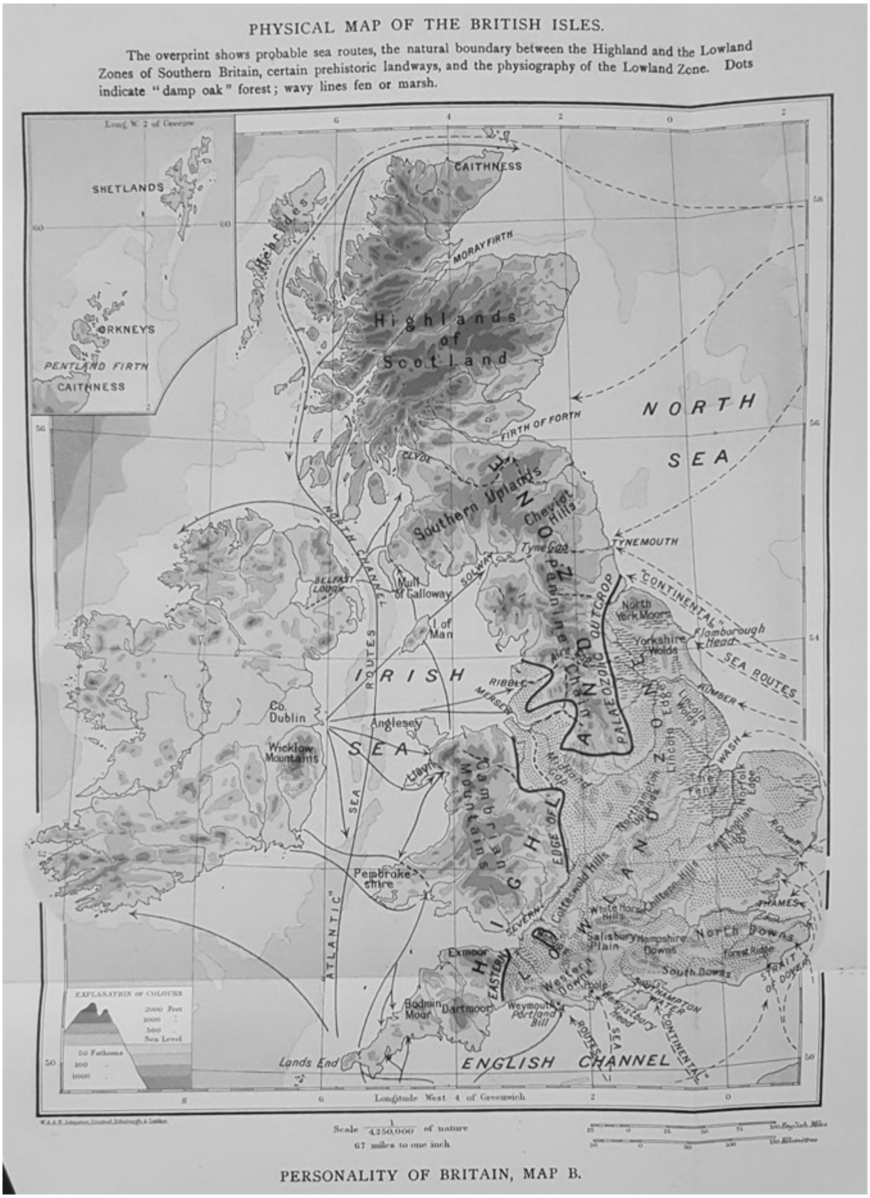

PHYSICAL MAP OF THE BRITISH ISLES.
The overprint shows probable sea routes, the natural boundary between the Highland and the Lowland Zones of Southern Britain, certain prehistoric landways, and the physiography of the Lowland Zone. Dots indicate "damp oak" forest; wavy lines fen or marsh.
SHETLANDS
ORKNEYS
PENTLAND FIRTH
CAITHNESS
Hebrides
MORAY FIRTH
Highlands of Scotland
FIRTH OF FORTH
NORTH SEA
CLYDE
Southern Uplands
Cheviot Hills
Tyne Gap
TYNEMOUTH
NORTH CHANNEL
BELFAST LOUGH
Mull of Galloway
SOLWAY
I of Man
Pennine Chain
PALAEOZOIC OUTCROP
North York Moors
Yorkshire Wolds
Flamborough Head
CONTINENTAL SEA ROUTES
HUMBER
Lincoln Wolds
IRISH SEA
RIBBLE
MERSEY
Aire Gap
Co. Dublin
Wicklow Mountains
Anglesey
Llayn
Midland Gap
WASH
The Fens
Cambrian Mountains
Northampton Uplands
Lincoln Edge
Norfolk Edge
East Anglian Ridge
HIGHLAND ZONE
LOWLAND ZONE
EDGE OF LOWLAND
ROUTES
SEA
"ATLANTIC"
Pembrokeshire
SEVERN
Cotteswold Hills
White Horse Hills
Chiltern Hills
THAMES
Salisbury Plain
Hampshire Downs
North Downs
Forest Ridge
South Downs
STRAIT OF DOVER
Exmoor
EASTERN
Western Downs
Poole
SOUTHAMPTON WATER
Bodmin Moor
Dartmoor
Weymouth
Portland Bill
Hengistbury Head
CONTINENTAL
Lands End
ENGLISH CHANNEL
EXPLANATION OF COLOURS
2000 Feet
1000
500
Sea Level
50 Fathoms
100
1000
Longitude West 4 of Greenwich
Scale 1/4,250,000 of nature
67 miles to one inch
English Miles
Kilometres
PERSONALITY OF BRITAIN, MAP B.

Figure 3.5 Map B and Map C from the *Personality of Britain* (fold-out maps bound into the second edition, 1933) showing Crawford's stages of "prehistoric geography" (1922b) applied to a distribution map of the whole of the British Isles.

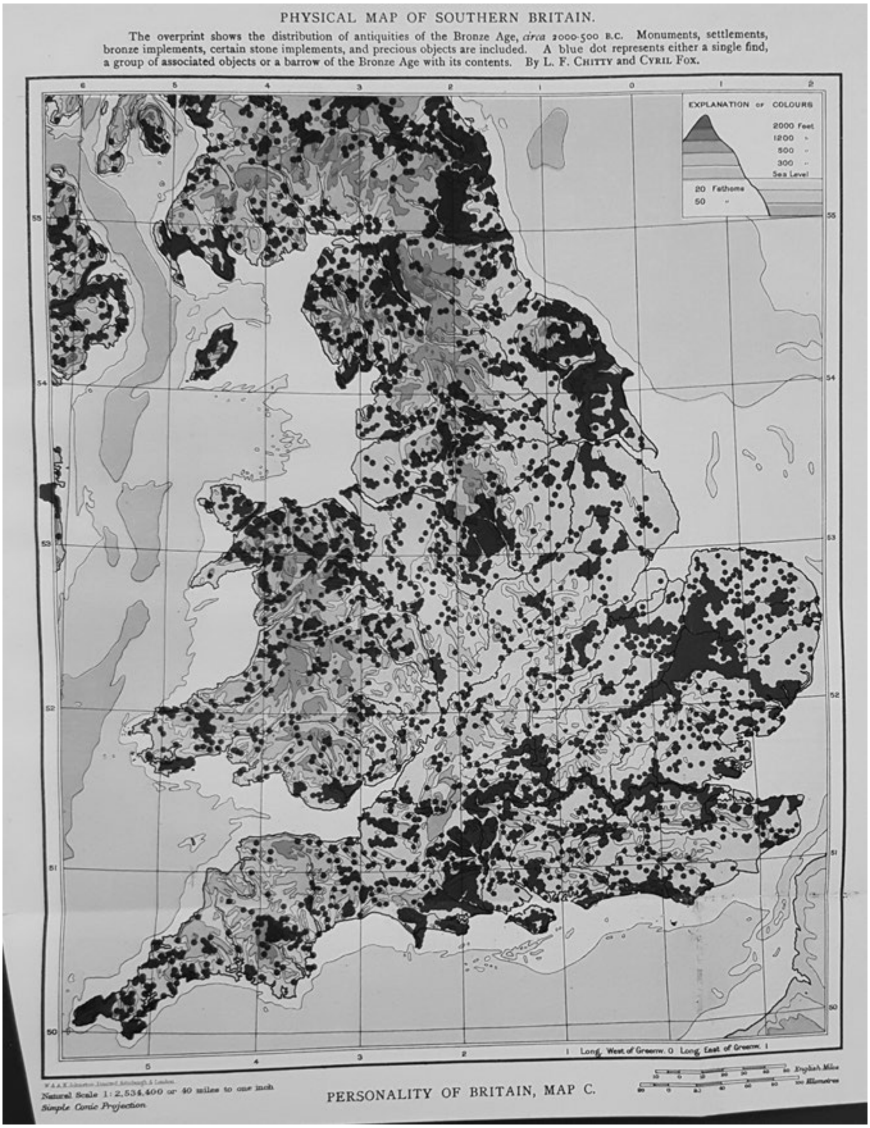

PHYSICAL MAP OF SOUTHERN BRITAIN.
The overprint shows the distribution of antiquities of the Bronze Age, *circa* 2000-500 B.C. Monuments, settlements, bronze implements, certain stone implements, and precious objects are included. A blue dot represents either a single find, a group of associated objects or a barrow of the Bronze Age with its contents. By L. F. Chitty and Cyril Fox.
EXPLANATION of COLOURS
2000 Feet
1200 "
500 "
300 "
Sea Level
20 Fathoms
50 "
Long. West of Greenw. 0 Long. East of Greenw.
English Miles
Kilometres
Natural Scale 1: 2,534,400 or 40 miles to one inch
Simple Conic Projection
PERSONALITY OF BRITAIN, MAP C.

Figure 3.5 (Continued)

(Johnston 1920). From 1906, the Ordnance Survey increased the size of its one-inch series and put it on sale at a price not out of reach of a middle-class market (ibid: 193). In the 1890s, schemes were proposed for the creation of a 'Geographical Memoir' to the Ordnance Survey based on the one-inch series, incorporating topography, geology, hydrology, climate, census reports, imports and exports, agricultural, statistical and archaeological

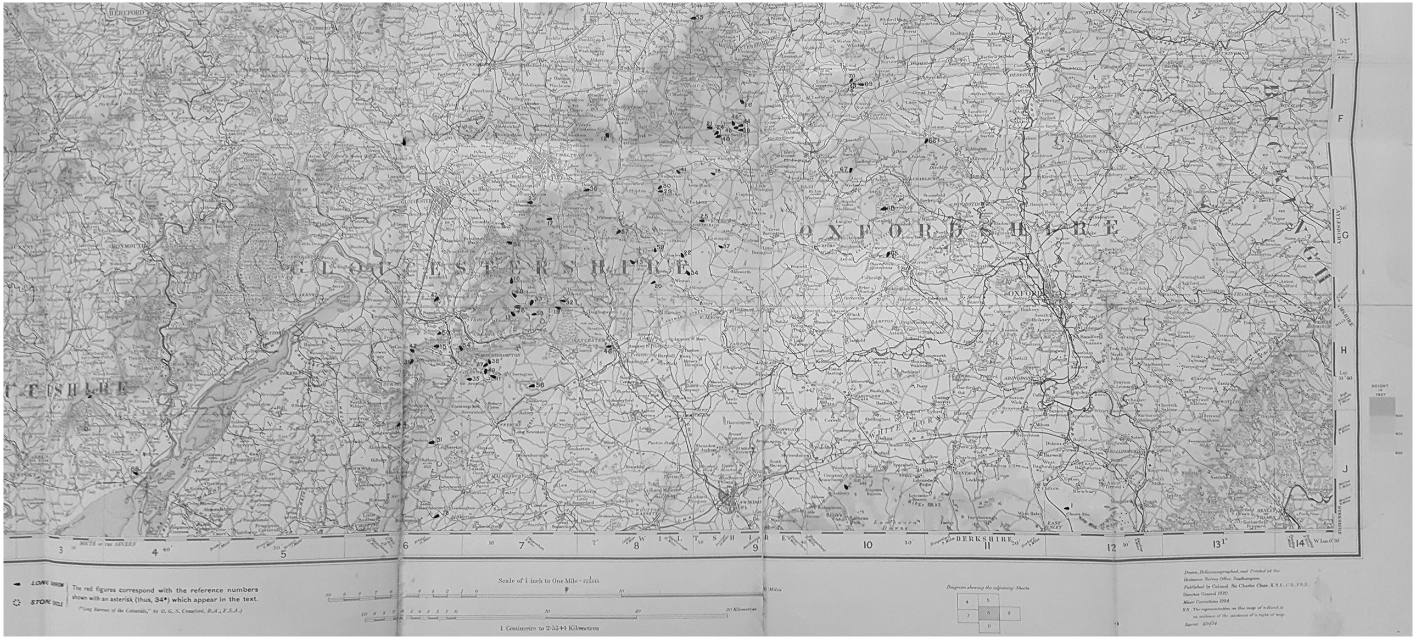

GLOUCESTERSHIRE
OXFORDSHIRE
BERKSHIRE
WILTSHIRE
OXFORD
CHELTENHAM
AYLESBURY
F
G
H
J
3
4
5
6
7
8
9
10
11
12
13
14
Scale of 1 inch to One Mile
1 Centimetre to 2·5344 Kilometres
Diagram showing the adjoining Sheets
LONG BARROW
STONE CIRCLE
The red figures correspond with the reference numbers shown with an asterisk (thus, 34*) which appear in the text.
("Long Barrows of the Cotswolds," by O. G. S. Crawford, B.A., F.S.A.)

Figure 3.6 Detail from a separate pull-out map from the inside back pocket of Crawford's (1925) *Long Barrows of the Cotswolds*, showing use of alpha-numerical grid system. The survey, and the published map, were devised around Sheet 8 of the quarter-inch Ordnance Survey.

data and combining them to produce a synthesis in the manner of regional Geography (Mill 1896). Another regional scheme – for organizing anthropological and archaeological information – was proposed by Peake in 1912 (the same year that the O.S. started producing the quarter-inch series in large sheets (Johnston 1920)). Peake's *Anthropological Survey of the British Isles* would be organized by reformatting Ordnance Survey quarter-sheets into a system based on parishes and counties. Each local unit would have a secretary reporting to a "body of experts in every department", with dedicated offices and library. Peake's survey would answer what he saw as the most crucial questions of prehistory, as well as addressing "many sociological problems" (Peake 1912: 56). Only distribution mapping, Peake insisted, could prove or disprove important questions such as whether "great and rich centres of population have always arisen at those points where the greatest number of trade routes converge, and that the possession or loss of such centres has caused the rise and loss of states." A series of maps was proposed "on which are shown the principal lines that trade has followed during successive ages", including maps of "the distribution of discoveries of articles traded – bronze celts, amber, pigs of lead and the like as well as the position of the gold, copper and tin mines of antiquity". The present "density of the population, the economic conditions of the people and maps illustrating lunacy, poverty and crime" could be related to maps of environment, archaeology and folklore showing "the distribution of various customs" and an anthropometric survey along the lines of Fleure's "with maps illustrating head form, stature and colour" (Peake 1912: 57). In this way, archaeological distribution mapping could become part of a wider project enabling civic planning for the future of Britain and her imperial territories (Peake 1912: 56).

Ordnance Survey quarter-inch maps supplied an all-purpose base map onto which archaeological features could be plotted, in the field, if necessary. Reconstructed vegetation coverage could then be superimposed to interpret the clustering of distributions. The large fold-out map at the end of Williams-Freeman's *Introduction to Field Archaeology* was "superimposed on the Ordnance Map of Quarter Inch to a Mile" of 1914 (Figure 3.3, above). After the Great War (First World War), the Ordnance Survey revised the one-inch and quarter-inch series, making available the one-inch "Popular Maps", "Outline Maps" and "Tourist District Maps", and the quarter-inch series (Johnston 1920). As these titles suggest, the Ordnance Survey was both responding to the rise of popular motoring and participating in what David Matless calls "the making of a geographer–citizen"; a tourist who was also an observant surveyor of the landscape, and who might use their leisure to develop an interest in field archaeology (Matless 1998: 77–79).

After the war, and the rise of a popular market in tourist maps, it became apparent that the Ordnance Survey's published maps had failed to keep up with archaeology's new map-modernizers. Six-inch maps were issued free of charge "to certain qualified persons" in exchange for "archaeological information inserted on them, to add to and correct what was already there" (Hauser 2008: 53). On his release from Holzminden, Crawford became an assiduous contributor of new information, replacing antiquarian identifications with modern terminology. By 1920, Sir Charles Close, the O.S. Director General "'thought he might do worse' than offer him a permanent position" (Hauser 2008: 54).[17] On his appointment as the Ordnance Survey's first Archaeology Officer, Crawford began collecting information on quarter-inch series maps, much as one of Peake's "body of experts" might and using Peake's Megalithic Index as a source of primary information (Peake 1912; Hauser 2007: 113). After personally visiting 208 archaeological sites (Hauser 2008: 59), Crawford produced a map based on a single sheet: *The Long Barrows of the Cotswolds. A Description of the Long Barrows, Stone Circles and other Megalithic Remains in the area covered by Sheet 8 of the Quarter-Inch Ordnance Survey comprising the Cotswolds and the Welsh Marches*. The map was first produced as an O.S. Professional Paper on a quarter-inch map specially printed in 1920 (Hellyer 1989: 112) and expanded into a book in 1925.

Although it looks innocuous today, anyone familiar with the earlier quarter-inch series would have been instantly struck with the modernity of Crawford's map of Cotswolds prehistory, since it was bisected by sheetlines. The National Grid was not widely available until after the Second World War, and grid systems were unusual until the 1920s. British Grid Systems, measured in 5,000 yard squares and based on the metric Transverse Mercator projection, were introduced on some small-scale military maps from 1919 (compare Figures 3.3 and 3.6).[18] By including a grid, Crawford kept his map fully up-to-date with cartographic innovation. Another regionally inspired archaeologist also recognized the value of sheetlines; Fox's *Archaeology of the Cambridge Region* (1923) included a specially devised alpha-numeric grid "for the rapid identification of places" in the index (Fox 1947: 3).

Such is the eminence of Crawford today that he is not uncommonly misremembered as the inventor of archaeological techniques – aerial archaeology and the O.S. period maps, for example – he did not, in fact, invent. It was Charles Close, not Crawford, who instigated the first O.S. period maps (Hellyer 1989). Nonetheless (as with aerial archaeology), it was Crawford who seized the potential of this idea, popularized it, and adapted it to fit his geographically inspired theories. Particularly important was Crawford's time-slice approach that has become known as "one map, one period" (Hellyer 1989:112). Charles Close's idea of historical mapping had been "that all historical and historical sites of whatever period should be added to a small scale map in an attempt to create a cartographical history of England", and he had a map of the Oxford district drawn up on this basis (Hellyer 1989:112). However, the idea of maps as time-slices (of the present as well as the past) was well established in regional geography: J.F. Unstead had written of geography as the cutting of "historical sections through time" in 1907 (cited in Darby 1987: 121, see also Bassin and Berdoulay, 2004 for an overview of the time slices approach in historical geography). From 1906, Crawford's Oxford tutor Herbertson organized a lecture series in which each lecture was devoted to an historical period (Steel 1987b). The lecture on Roman Britain was given by Francis Haverfield, a pioneer in the production of historical maps of Roman Britain. Crawford's insistence on "one map one period" was in keeping with his concept of the archaeological landscape as a palimpsest comprising a series of superimposed layers and with his theoretical conception of the past as a series of "cycles" (for more on these elements of Crawford's theoretical approach, see Hauser 2007, 2008). Crawford's O.S. Map of Roman Britain (1924) had a physical base map specially produced to allow him to overlay his own understanding of vegetation coverage in the past as Williams-Freeman and Cyril Fox had done (see Figure 3.2, Fox 1923; Hellyer 1989). Crawford's O.S. period maps were to allow an ever-increasing audience of time travellers to walk through specific landscapes envisaging them transformed to another (illusory) point in time, much as H.G. Well's time traveller had walked across the landscape of Surrey and been able to envisaged its specific geography thousands of years in the future.[19]

'Geographer–citizens': utopia and the politics of survey

In the early decades of the twentieth century, archaeological mapping was meaningful as part of a set of discursive practices constructing a new type of ideal citizen, which Matless has called the "geographer–citizen" (1998). The geographer–citizen was informed about their local and regional environs, and able to relate these to their place in the empire and the world. He or she was proficient in the practices of map-use, and also able to participate in the activities of survey. Producing archaeological maps was linked to performances that inculcated particular kinds of geographical subjectivity. The production and use of archaeological maps intervened in relationships between people and state. The geographer–citizen is a useful concept for thinking through how archaeological mapping was connected to a politics of survey in its early days, a politics in which Fleure, Peake and Crawford were actively engaged, and which lent extra fervour to their mission of archaeological modernization.

The politics of survey was perhaps most explicit in the connections between geography and planning. Among the fiercest proponents of a new science of planning was the regionalist Patrick Geddes. His best known maxim "Survey then Plan" has been "repeated thousands of times to generations of planning students" (Scott and Bromley 2013: 112). For Geddes, survey not only produced information, but the practice of mapping was also a vehicle for involving local communities in planning decisions: "If each village, town, and city surveys its own environment and builds up resources for enhancing its residents understanding of their own history and circumstances", argued Geddes's collaborator Victor Branford, "they can better formulate plans for the future" (Scott and Bromley 2013: 112). *How* maps were made was as important as *why* they were made – in fact the how, what and why of the map were often inseparable. Survey was a participatory performance that could revitalize modern communities and reform the modern citizen. It could be a tool for folk renewal based on investigating connections between people and local environments. Properly understood, such connections could be used for everything from city planning to eugenic population control. Universities and museums would be reformed as centres for regional survey. Within this project of reform, an improved and democratized (field) archaeology would be placed in the service of planning the future.

Geddes knew Fleure and Crawford, and possibly also Peake, and his influence is clear in certain of their projects. Fleure worked closely with Geddes, helping him to develop an exhibition in City Planning and Civics in Dublin in 1914, and writing a retrospective of Geddes's life based on their long friendship (1953). Crawford was introduced to Geddes by Herbertson, becoming "cannon fodder" for a while in "Geddes' war with society" (Hauser 2008: 22).[20] Peake and Fleure were involved with the Sociological Society, set up by Geddes and Victor Branford. They contributed books to the society's *Making of the Future* series and published in the *Sociological Review*.[21] It was for this series that Fleure developed his *Human Regions* (first published in France, 1918, and see Figure 3.4 above). Peake's 'The English Village', published in *Making of the Future* in 1922, aimed at the revitalization of rural communities, incorporating archaeology and anthropology into the solution of contemporary social ills. Like Geddes, Peake and Fleure were committed to political devolution on regional grounds. In the aftermath of the war, Peake led a sub-committee on "Regional Surveys and Local Studies" for The Geographical Association (of which Fleure was president): 'Devolution: A Regional Movement' (Peake 1919) was submitted to the post-war government's Ministry of Reconstruction. Peake outlined his "utopic ideas" on devolution and World Governance to Crawford, as part of a "long chat" he should like to have with H.G. Wells (who met Crawford in 1916 and was also an associate of Branford and Geddes). The planned conversation would have included: "The Division of England [into] provinces; the reconstruction of the countryside & the formation of larger villages; a world capital at Constantinople with a world university; a national museum for nature & history on a logical basis of arrangement."[22]

Regionalists believed survey would produce a rational understanding of the past that could be used to plan the future. Harnessed to planning, archaeological survey became a profoundly political and utopian project. Geddes and his followers aimed at "eutopias"; realistic, achievable planned futures that were the product of a continual process of analysis and reform. "Planned social change does not aim at a fanciful ideal", they argued but at something that was "realistically achievable" because it was "rooted in evolutionary tendencies" (Scott and Bromley 2013: 90). Systematically organized archaeological and anthropological surveys were essential to realistic planning. “Social heritage” of the people of a region “is an outcome of the shaping of an ancestral heredity by their environment and way of life” . . . “ any particular society therefore comprises a specific mix or balance of the various skills and dispositions that form its social heritage, which are held in a state of interdependence if not harmony” (Scott and Bromley 2013: 85).[23]

Regionalists opposed nationalism, and sought to direct geography and archaeology towards the production of “world citizens”. An important early source for their internationalist outlook was the anarchist geographer Elisee Reclus, whose 19-volume *Géographie universelle* was produced over two decades from the 1870s to 1890s. Reclus and Geddes were connected by their mutual friend Pyotr Kropotkin, and both Kropotkin and Reclus became involved in teaching on Geddes’s Edinburgh Summer Schools (Scott and Bromley 2013: 44). The idea of “world citizens” was important to Fleure, who was a committed anti-imperialist and pacifist (Gruffyd 1994). Fleure, Peake and Crawford were internationalists (Díaz Andreu 2007). Crawford’s involvement in the International Map of the Roman Empire was one of the few successful outputs of the programme to produce an International Map of the World before the United Nations took this up after the Second World War (Pearson and Heffernan 2015). Fleure’s internationalism was related to his complex stance on racial science and anthropometrics (Kushner 2008) that, borrowing Clayton’s (2011) notion of “anti-colonialist colonial geography”, one could call “racist anti-racialist” anthropology. In the 1930s, Fleure robustly opposed anti-semitism and “Aryanism”. In 1938 he founded the Manchester International Club to foster his life-long project of fostering world peace, “mutual aid and fellowship” (Fleure cited in Kushner 2008: 158), and after war was declared he was a supporter of The Manchester Resolution – a campaign for the rights of refugees (Kushner 2008). For many regional geographers, the ideal geographer–citizen was a world citizen, thinking globally but acting locally,[24] with the ability to situate themselves in space and time, and thus orientate themselves, accurately and precisely, towards a brighter future.

Producing the ‘geographer–citizen’ demanded a commitment to public engagement, education and what would now be called ‘outreach’. As previously noted, many regionalists were educationalists; academic geographers were much involved in training school teachers. Geography was “an instrument of humanist education providing a training in scientific observation and analysis and at the same time . . . a valuable influence in the enrichment of citizenship” (Fleure cited in Gruffyd 1996: 417). Education was a life-long task; universities and museums were “to play a key regional role educating citizens and allowing them to participate in the development of their region” (Fleure cited in Gruffyd 1996: 417). The Summer Schools movement, at Edinburgh (Geddes), Oxford (Herbertson), and Aberystwyth (Fleure) placed particular emphasis on training teachers whom Fleure also encouraged through his editorship of *The Geographical Teacher*. Peake was also involved in progressive educational reform (see Wickstead 2017). Under the influence of the regionalists, survey was enthusiastically taken up by large numbers of geography teachers and practiced widely inside and outside classrooms across Britain and the empire (Matless 1992).

Geddes and Branford "placed particular emphasis on the education of youth and the role of youth movements in the formation of informed and socially responsible citizens committed to social reconstruction" (Scott and Bromley 2013: 129). "Scouting", Victor Branford declared, is " perhaps the most notable advance towards eutopia made in our times" (cited in Scott and Bromley 2013: 150). As early as 1909, *The Geographical Teacher* carried approving articles on the German Wandervogel (Thomson and Haehnel 1909). By the end of the First World War, many regionalists came to believe that Baden Powell's Scouts had taken an uncomfortably militaristic turn, subverting the original Woodcraft principles that Baden Powell adopted from Seton Thompson in the 1890s. Fleure was connected to alternative scouting movements, including the Welsh League of Youth "Yr Udd" (Gruffyd 1996). He was on the council of the Order of Woodcraft Chivalry (OWC), an alternative scout movement set up by the geologist and archaeologist Ernest Westlake in 1916. The OWC was strongly influenced by Westlake's recapitulationist prehistory, and inculcated both archaeological and geographical field skills in the children and adults who were part of the movement (Westlake 1917). Unlike the Boy Scouts of the time, the OWC was co-educational,[25] and had many adult members. The movement was divided into Wood Cubs (aged 8–12), Woodcraft Scouts (12–15) and Pathfinders (15–18), with adult "Way-wardens". As these names suggest, orientation, hiking, map-reading and map-making featured strongly in the "Deed System" (Prometheus 1947), which also specified tasks in "regional survey" and "civic survey". Another associate of the Cult of Kata – the folk dance pioneer and feminist Mary Neal – helped to found the Kibbo Kift Kindred, an alternative scouting movement that made use of archaeological survey (including profiles and plans of archaeological monuments) in its designs for its banners (Ross and Bennett 2015). The Order of Woodcraft Chivalry and Kibbo Kift Kindred were each strongly influenced by regional geography, and both drew directly on the inspiration of evolutionary theory and field archaeology (Westlake 1917; Hargrave 1927: 303).

The valourization of survey within a utopian political frame lent the practice of field archaeology urgency and made it relevant to a wider citizenry. Crawford's work at the Ordnance Survey involved much more than cartography, it involved building a network of informed field archaeologists – citizen–geographers – capable of performing mapping and using maps appropriately. Crawford had no official staff until 1938, however, as the Cult of Kata and its circle had, Crawford set up a network of "honorary correspondents" communicating by letter (including many who would go on to be professionals; William Grimes, Charles Phillips, and Kenneth St Joseph (Hellyer 1989: 111)). Just as Hippisley-Cox had done with his 'Society of Green Roads', Crawford also set out to use his publications to actively solicit members of the public to participate in the production of future maps. Crawford's "ferrets", some of whom were "barely out of short trousers" were "retired surgeons, ex-colonels, land-owners and country-curates," as well as members of archaeological societies (Hauser 2008: 60–61). From 1921, Crawford produced a sheet of instructions and a specimen marked up 6-inch map as his "Notes for Beginners in Field Archaeology" (Hellyer 1989: 111). Crawford also ensured that aerial photographs and photographs of historic maps were made available for consultation at the Ordnance Survey (Crawford 1926: 67). Given his extremely restricted resources, Crawford's network building could be seen as merely pragmatic, but it also fits with aspects of the map-work he had experienced before the war as part of the Cult of Kata and its circle. The creation of a community of field archaeologists perpetuated the politics of survey Crawford had learnt from regional geographers. It was an approach that Crawford would put to good use in creating a network of subscribers for his new journal *Antiquity* (Hauser 2007: chapter 3).

Conclusion

In this chapter I have explored the meanings of mapping in relation to networks of sociality and knowledge production in the early decades of twentieth-century Britain. I have focused not on maps, so much as on the meanings of the activities that went into their production and use. Focusing on only three individuals – Fleure, Peake and Crawford – I investigated the meanings of mapping performances at different scales; firstly, the personal and intimate meanings of mapping within the Cult of Kata and the Kataric Circle; secondly, the professional meanings of mapping as part of the institutionalization of regional geography; and, thirdly, the public and participatory politics of planning within the regional survey movement. The practice of field archaeology and the activities of mapping, I argue, are best understood as meaningful within a set of discursive practices aimed at producing 'citizen–geographers' and 'world citizens', capable of locating and orientating themselves within the times and spaces of imperial and evolutionary geographies.

This chapter has ventured only a small survey of part of the extensive and poorly mapped terrain of the history of mapping in archaeology. Within this landscape, Crawford stands as one of the better-known landmarks, but even within Britain, there is much to be explored, let alone within the histories of mapping in other parts of the world.[26] One of the most interesting aspects of the history of mapping presented here is how practices of mapping became meaningful within public discourses that were avowedly political, as well as within private discourses that were humorous and ironic (and also political). This is not to say that the information gathered through survey was not as the outcome of objective, scientific and rational methods (Daston and Galison 2010). Fleure, Peake and Crawford prized objectivity and scientific rigor was essential to their practice. However, the motivations that sent them into the field, collectively and individually, which gave their activities social meaning and created audiences who would receive and use their maps, were framed by the requirements of the times and places in which they lived. A number of questions arise from this history that are pertinent to how archaeologists might begin to rethink the map today: What difference does it make to produce maps in an era when the ideology of the consumer predominates over that of the citizen? How is contemporary mapping made meaningful in the contemporary information economy when map consumers are enjoined to contribute geographical information to vast monetized spatial databases? How do social initiatives connected to Public Participatory GIS and online crowd-sourced mapping projects (such as Historic England's Pride of Place project[27]) compare to the regional surveys of the early twentieth century? What forms of subjectification and sets of discursive practices make contemporary mapping activities meaningful, by and for whom? And what difference does understanding the historical context of map production make to how we might rethink mapping today? By investigating the histories of mapping archaeologists encounter archaeology itself in new and unexpected ways. Archaeological maps, which seemed familiar – even the humble distribution map – may be occulted with strange meanings, becoming something other than we had thought. It is such encounters – meetings with ourselves coming back – that provoke us to rethink the map.

Notes

1 Nearly a hundred years later, in 2015, more distribution maps of the inherited characteristics of the UK population were published in the journal *Nature*. Crowded with symbols, much as Fleure's maps were, these maps plotted the distribution of genetic haplotypes of the UK population (Leslie et al. 2015). Although no direct evidence was found for living Palaeoliths, the way the results were geographically displayed and interpreted shares much with Fleure's methods: "Genetic differentiation within the UK" it was argued, showed "marked concordance with geography" . . . "Relative isolation has clearly been a major determinant of fine-scale population structure within the UK" (Leslie et al. 2015: 312–314).

2 The first university chair in Geography was established at University College in 1833, but this lapsed after three years. The first UK professor of Geography was P.M. Roxby, appointed at Liverpool University in 1917.

3 Fleure's championing of the "humanistic" aspects of geography and the discipline's potential contribution to future utopia obtained him some damning feedback from the interview panel for his new professorship: "Fleure's printed statement is somewhat vague and a bit hysterical. His conception of the field of geography lacks precision; some may answer he claims too much . . . The Physical and Mathematical (including the Cartographical) sides of the subject should be included . . . He ought to realize that the physical side is indispensable for the adequate treatment of the human side" (RGS archives cited in Withers 2000:95). He got the job nonetheless.

4 Estyn Evans was also a friend of Crawford (Thomas 2012). He was to become an important collaborator of Crawford's, working on Crawford's plans for Ordnance Survey Period Maps in Northern Ireland (Hellyer 1989).

5 Letter from Charlotte Peake to O.G.S. Crawford, April 1911. Crawford Archive, Bodleian Library, Oxford.

6 Letter, Harold Peake to Crawford, 30 December 1913.

7 Richard Lowe Thompson is rather overlooked in the history of archaeology today, despite publishing two unorthodox books relevant to the archaeology of his times; *The Hunter in Our Midst* (1926) and *A History of the Devil* (1929). For more on this captivating man and his theories of sex and sexuality, see Wickstead 2017.

8 Letters place the centrality of Crawford and Peake to the Cult of Kata beyond doubt. The extent of Fleure's participation, if he was involved at all, is less certain. However, he was a frequent visitor to Boxford and Brittany, and his commemoration of Peake (in Peake and Fleure 1956) shows he was well aware of the range of theatrical activities taking place there.

9 For example, in letters from Harold and Carli Peake to Crawford and between Crawford and Lowe Thompson (Wickstead 2017); see also letter between Heywood Sumner and Crawford 1912.

10 The Ridgeway Base between Liddington Castle and White Horse Hill replaced an earlier Salisbury Plain base which was dropped in 1937 because its terminals were not intervisible (Owen and Pilbeam 1992: 129).

11 Evolutionary theory was a diverse and contested field in this period (Bowler 1983). Darwinian evolution was merely one approach among many. Evolutionists like Geddes often tempered Darwinian approaches with strongly neo-Larmarckian interpretative frameworks. Fleure described himself as a supporter of the "modern Mendelian hypotheses", albeit with strong qualifications about the profound influences of environment (Fleure and James 1916: 40). Fleure opposition to environmental determinism has led his work to be associated with neo-Lamarckism, although he was also a eugenicist (Fleure 1922).

12 Fleure wrote the preface to a Manchester University Press edition of Vidal de la Blanche's *La personnalité géographique de la France* in 1941.

13 An anonymous reporter on the new schemes for regional postwar subdivisions preferred the regionally inclined models, which divided Germany into "ethnic" regions (Anon 1919).

14 Herbertson led the Geography diploma at Oxford where he was an important mentor to O.G.S. Crawford (Hauser 2008).

15 "I find that in regional eyes you wear a triple halo", wrote Carli Peake to Crawford on 12 April 1917. "Say A.M.G.K. [Almighty Goddess Kata] and don't be stuck up." The majority of Crawford's early scholarly publications were in geography, rather than archaeology, and it is telling that he preferred to announce his early discoveries in aerial archaeology at the Royal Geographical Society rather than the Society of Antiquaries (Barber 2011).

16 Fox explicitly cites Crawford, Fleure and Williams-Freeman, as well as H.M. Chadwick as early influences, however he notes that Crawford's *Man and His Past* (1922a) was published "when the typescript of the *Archaeology of the Cambridge Region* was well towards completion" (1947: 2).

17 Charles Close already knew Crawford; he had first met him in 1911, and then took a delivery of maps from him during the war when Crawford was posted with Third Army Maps (Hellyer 1989).

18 The creation of the new grid systems was actually a serious obstacle to Crawford's publication of period maps. Between 1919 and 1934, three different sets of quarter-inch sheetlines were introduced causing significant technical headaches to Crawford and his team (Hellyer 1989: 113).

19 Crawford's period maps included Roman Britain (1924), Neolithic Wessex (1932) and Britian in the Dark Ages (1935 and 1983) (see Hauser 2007: 113; Hellyer 1989).

20 Crawford's archive contains notes of the lectures Geddes gave at the Oxford Geography Summer School where the young Crawford was an instructor.

21 Crawford also published in Geddes and Branford's *Sociological Review*, in an article reflecting his socialist (dialectical and cyclical) theory of the past (Hauser 2008).

22 Letter, Harold Peake to OGS Crawford, 16 May 1917.

23 The potential dangers of this approach can be seen in Fleure's "zones of debilitation" which essentialized inequality as a "fact" of racial and environmental inheritance (1919a). Regionalism and planning shaded, at times, into eugenics (Fleure 1922). A letter of April 1911 from Carli Peake to Crawford gave him the address of a "Mrs Alexander" at address "Eugenic Society, Kingsway House, Kingsway".

24 ". . . our region serves as a mirror, a miniature if you like, of the evolution of our civilisation. Let us spread the feeling that in addition to being citizens of our region we are citizens of civilisation" (Fleure cited in Gruffyd 1996:418).

25 The movement was co-educational; it allowed boys and girls to be in separate small groups within a "clan" after the age of 12 (Westlake 1917: 6).

26 Crawford's mapping of Sudan has not been included here (see Hauser 2008: 253–254).

27 Pride of Place maps England's LGBTQ heritage through an interactive crowd-sourced map showing places identified as significant by the public: https://historicengland.org.uk/research/inclusive-heritage/lgbtq-heritage-project/

References

Annan, Noel (1955) The Intellectual Aristocracy. In Plumb, J. (ed.) *Studies in Social History*. London: Longmans Green and Co.

Anon (1919) Proposed New Administrative Subdivisions of England, France and Germany. *The Geographical Review* Vol. 7(2), pp. 114–118.

Barber, M. (2011) *A History of Aerial Photography and Archaeology: Mata Hari's Glass Eye and Other Stories*. English Heritage.

Barber, M. (2016) Capturing the Material Invisible: O.G.S. Crawford, Ghosts and the Stonehenge Avenue: Bulletin of the History of Archaeology. *Special Collection: World Histories of Archaeology*.

Bassin, Mark and Berdoulay, Vincent (2004) Historical Geography: Locating Time in the Spaces of Modernity. In Strohmayer, Ulf and Benko, Georges (eds.) *Human Geography: A History for the 21st Century*. London: Edward Arnold Ltd., pp. 64–82.

Berdoulay, Vincent (2011) German Precursors and French Challengers. In Agnew, John A. and Duncan, James S. (eds.) *The Wiley-Blackwell Companion to Human Geography*. Oxford: Blackwell, pp. 73–88.

Bowden, Mark (2001) Mapping the Past: O.G.S. Crawford and the Development of Landscape Studies. *Landscapes* Vol. 2(2), pp. 29–45.

Bowen, E.G. (1987) Geography at the University of Wales, 1918–1945. In Steel, Robert (ed.) *British Geography, 1918–1945*. Cambridge: Cambridge University Press.

Bowler, Peter (1983) *The Eclipse of Darwinism: Anti-Darwinian Evolution Theories in the Decades Around 1900*. Baltimore and London: John Hopkins University Press.

Boyd Dawkins, William (1880) *Early Man in Britain and His Place in the Tertiary Period*. London: Macmillan and Co. Ltd.

Campbell, John A. (1972) Some sources of the humanism of H.J. Fleure. Research Papers (University of Oxford. School of Geography), No. 2.

Clayton, Daniel (2011) Colonizing, Settling and the Origins of Academic Geography. In Agnew, John A. and Duncan, James S. (eds.) *The Wiley-Blackwell Companion to Human Geography*. Oxford: Blackwell, pp. 50–70.

Crawford, O.G.S. (1912) The Distribution of Early Bronze Age Settlements in Britain. *In the Geographical Journal* Vol. 40(2), pp. 184–197.

Crawford, O.G.S. (1913) Prehistoric Trade Between England and France. *L'Anthropologie* Vol. 24, pp. 641–649.

Crawford, O.G.S. (1922a) *Man and His Past*. Oxford: Oxford University Press.

Crawford. O.G.S. (1922b) Prehistoric Geography. *Geographical Review* Vol. 12(2), pp. 257–263.

Crawford, O.G.S. (1924) *Ordnance Survey Map of Roman Britain*. Ordnance Survey, Southampton and London: HMSO.

Crawford, O.G.S. (1925) *The Long Barrows of the Cotswolds*. A description of the long barrows, stone circles and other megalithic remains in the area covered by sheet 8 of the quarter-inch Ordnance Survey comprising the Cotswolds and the Welsh Marches. Gloucester: John Bellows.

Crawford, O.G.S. (1926) Archaeology and the Ordnance Survey. *The Geographical Journal* Vol. 67(1), pp. 66–68.

Daniels, Stephen (2006) Lines of Sight: Alfred Watkins, Photography and Topography in Early Twentieth-Century Britain, Tate Papers No.6, Autumn 2006. London: Tate Gallery.

Darby, H.C. (1987) On the Writing of Historical Geography, 1918–1945. In Steel, Robert (ed.) *British Geography, 1918–1945*. Cambridge: Cambridge University Press, pp. 117–137.

Daryll Forde, C. (1929) The Megalithic Gallery in Brittany. *Man* Vol. 29, pp. 105–109.

Daryll Forde, C. (1930) The Early Cultures of Atlantic Europe. *American Anthropologist* Vol. 32(1), pp. 19–100.

Daston, Lorraine and Galison Peter (2010) *Objectivity*. London: Zone Books.

Davies, Elwyn and Fleure, H.J. (1958) Physical Characters among Welshmen. *Journal of the Royal Anthropological Institute* Vol. 88, pp. 45–95.

Díaz Andreu, Margarita (2007) Internationalism in the Invisible College: Political Ideologies and Friendships in Archaeology. *Journal of Social Archaeology* Vol. 7(1), pp. 29–48.

Evans, Emyr Estyn (1969) Emeritus Professor Herbert John Fleure. *The Geographical Journal* Vol. 135(3), pp. 484–485.

Evans, Emyr Estyn, Chart, D.A.E. and Lawlor, D.C. (1940) *A Preliminary Survey of the National Monuments of Northern Ireland*. Belfast: H.M.S.O.

Fleure, H.J. (1915) Regional Study in Museums. *In Museums Journal* Vol. 14, pp. 373–379.

Fleure, H.J. (1918a) The Regional Survey Preparatory to Town Planning. *Journal of the Town Planning Institution* Vol. 4(31–38).

Fleure, H.J. (1918b) The Racial History of the British People. *Geographical Review* Vol. 5(3), pp. 216–231.

Fleure, H.J. (1919a) Human Regions. *Scottish Geographical Magazine* Vol. 35(3), pp. 94–105.

Fleure, H.J. (1919b) *Human Geography in Western Europe: A Study in Appreciation*. The Making of the Future Series. London: Williams Norgate.

Fleure, H.J. (1921) Countries as Personalities. *Nature* Vol. 108, pp. 573–575.

Fleure, H.J. (1922) Some Aspects of Race Study. *In Eugenics Review* Vol. 14, pp. 93–102.

Fleure, H.J. (1932) Archaeology and Folk Tradition. *Proceedings of the British Academy* Vol. 17, pp. 369–390.

Fleure, H.J. (1940) Rough Stone Monuments in Western Europe. *Bulletin of the John Rylands Library* Vol. 24, pp. 234–249.

Fleure, H.J. (1946) British Museum: Exhibition of Selected Specimens. *Man* Vol. 46, pp. 99–100.

Fleure, H.J. (1948) Archaeology and Folklore. *Folklore* Vol. 59, pp. 69–74.

Fleure, H.J. (1953) Patrick Geddes (1854–1932). *Sociological Review* Vol. 1(2), pp. 5–128.

Fleure, H.J. and Dunlop, M. (1942) Glendarragh Circle and Alignments, the Braaid, Isle of Man. *Antiquities Journal* Vol. 22, pp. 39–53.

Fleure, H.J. and James, T.C. (1907) A Preliminary Report on the Progress of the University of Wales Ethnographical Survey. *Man* Vol. 7, p. 139.

Fleure, H.J. and James, T.C. (1916) Distribution of Anthropological Types in Wales. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* Vol. 46, pp. 35–153.

Fleure, H.J. and Peake, H.J.E. (1930) Megaliths and Beakers. *Journal of the Royal Anthropological Institute* Vol. 47.

Fleure, H.J. and Whitehouse, W.E (1917) A Map of Primitive Britain. *The Geographical Teacher* Vol. 9, pp. 85–87.

Fox, Aileen (2000) *Aileen: A Pioneering Archaeologist: The Autobiography of Aileen Fox*. Leominster: Greenwing.

Fox, Cyril (1923) *The Archaeology of the Cambridge Region: A Topographical Study of the Bronze, Iron, Roman and Anglo-Saxon Ages, with an Introductory Note on the Neolithic Age*. Cambridge: Cambridge University Press.

Fox, Cyril (1947) Reflections on the Archaeology of the Cambridge Region. *The Cambridge Historical Journal* Vol. 9(1), pp. 1–21.

Fox, Cyril (1959) *The Personality of Britain: Its Influence on Inhabitant and Invader in Prehistoric and Early Historic Times*. Fourth Edition. Cardiff: National Museum of Wales.

Freeman, T.W. (1987) Geography During the Interwar Years. In Steel, Robert (ed.) *British Geography, 1918–1945*. Cambridge: Cambridge University Press, pp. 9–24.

Geddes, Patrick (1898) The Influence of Geographical Conditions on Social Development. *The Geographical Journal* Vol. 12(6), pp. 580–586.

Gruffyd, Pyrs (1994) Back to the Land: Historiography, Rurality and the Nation in Interwar Wales. *Transactions of the Institute of British Geographers* Vol. 19(1), pp. 61–77.

Gruffyd, Pyrs (1996) The Countryside as Educator: Schools, Rurality and Citizenship in Interwar Wales. *Journal of Historical Geography* Vol. 22(4), pp. 412–423.

Gruffyd, Pyrs (2004) Fleure, Herbert John (1877–1969). In *Oxford Dictionary of National Biography*. Online Edition. Oxford: Oxford University Press, May 2006 [www.oxforddnb.com/view/article/33179, accessed 8 November 2014].

Guest, Edwin (1857) The Four Roman Ways. *Archaeological Journal* Vol. 14(1).

Hargrave, John (1927) *The Confession of the Kibbo Kift*. London: Duckworth.

Harley, Brian (1989) Deconstructing the Map. *Cartographica* Vol. 26(2), pp. 1–20.

Harris, Jose (1994) *Private Lives, Public Spirit: Britain 1870–1914*. Harmondsworth: Penguin Books, p. 220.

Hart, Bradley W. (2013) Science, Politics and Prejudice: The Dynamics and Significance of British Anthropology's Failure to Confront Nazi racial Ideology. *European History Quarterly* Vol. 43(2), pp. 301–325.

Hauser, Kitty (2007) *Shadow Sites: Archaeology and the British Landscape 1927–1955*. Oxford Historical Monographs. Oxford: Oxford University Press.

Hauser, Kitty (2008) *Bloody Old Britain: OGS Crawford and the Archaeology of Modern Life*. London: Granta.

Hellyer, Roger (1989) The Archaeological and Historical Maps of the Ordnance Survey. *The Cartographic Journal* Vol. 26(2), pp. 111–133.

Herbertson, A.J. (1905) The Major Natural Regions. *The Geographical Journal* Vol. 25(3), pp. 300–310.

Hippisley-Cox, R. (1914) *Green Roads of England, Facsimile Edition*. Glastonbury: The Lost Library.

Hustead Harper, Ida (ed.) (1922) *The History of Women's Suffrage in Six Volumes*. New York: National American Woman Suffrage Association.

James, E.O. (1969) Professor H.J. Fleure, D.Sc., F.R.S., F.S.A. *Folklore* Vol. 80(2), pp. 146–148.

James, William (1895) Report on the Census of Hallucinations. *In Psychological Review* Vol. 2(1), pp. 69–75.

Johnston, Ron (2011) Creating Human Geography in the English Speaking World. In Agnew, John A. and Duncan, James S. (eds.) *The Wiley-Blackwell Companion to Human Geography*. Oxford: Blackwell, pp. 89–113.

Johnston, W.J. (1920) The New One-Inch and Quarter-Inch Maps of the Ordnance Survey. *In the Geographical Journal* Vol. 55(3), pp. 192–200.

Kuper, Adam (1996) *Anthropology and Anthropologists: The Modern British School*. Third Edition. London: Routledge.

Kuper, Adam (2010) *Incest and Influence: The Private Life of Bourgeois England*. Cambridge, MA: Harvard University Press.

Kushner, Tony (2008) H.J. Fleure: A Paradigm for Inter-War Race Thinking in Britain. *In Patterns of Prejudice* Vol. 42(2), pp. 151–166.

Leslie, S., Winney, B., Hellenthal, G., Davison, D., Boumertit, A., Day, T., Hutnik, K., Cunliffe, B., Wellcome Trust Case Control Consortium, International Multiple Sclerosis Genetics Consortium, Lawson, D., Falush, D., Freeman, C., Myers, C., Robinson, M., Donnelly, P. and Bodmer, W. (2015) The Fine-Scale Genetic Structure of the British Population. *Nature* Vol. 519, pp. 309–313.

Levine, Phillippa (1986) *The Amateur and the Professional: Antiquarians, Historians and Archaeologists in Victorian England, 1838–1886*. Cambridge: Cambridge University Press.

Lowe Thompson, Richard (1926) *The Hunter in Our Midst*. Psychic Minatures Series. London: Keegan Paul, Trench and Trubner.

Lowe Thompson, Richard (1929) *The History of the Devil, or the Horned God of the West*. London: Keegan Paul, Trench and Trubner.

Mackinder, Halford (1887) On the Scope and Methods of Geography. *In Proceedings of the Royal Geographical Society* Vol. 9(2), pp. 141–174.

Mackinder, Halford (1902) *Britain and the British Seas*. London: Heinmann.

Matless, D. (1992) Regional Surveys and Local Knowledges: The Geographical Imagination in Britain, 1918–39. *Transactions of the Institute of British Geographers* Vol. 17(4), pp. 464–480.

Matless, D. (1998) *Landscapes and Englishness*. London: Reaktion Books.

Mill, Hugh Robert (1896) Proposed Geographical Description of the British Isles based on the Ordnance Survey. *The Geographical Journal* Vol. 7(4), pp. 345–356.

Moshenska, G. (2015) Thomas "Mummy" Pettigrew and the Study of Egypt in Early Nineteenth-Century Britain. In Carruthers, W. (ed.) *Histories of Egyptology: Interdisciplinary Measures*. Abingdon, UK: Routledge, pp. 201–214.

Owen, Tim and Pilbeam, Elaine (1992) Ordnance Survey: Map Makers in Britain since 1791. Ordnance Survey, Southampton and London: HMSO.

Peake, Harold (1906) Ancient Earthworks. In Ditchfield, P.H. and Page, William (eds.) *The Victoria History of Berkshire* Vol. 1. London: Archibald, Constable and Co. Ltd., pp. 251–284.

Peake, Harold (1907–1908) The Victoria County History of Berkshire. *In Berkshire Archaeological Journal* Vol. 13, pp. 101–105.

Peake, Harold (1912) Suggestions for an Anthropological Survey of the British Isles. *In Man* Vol. 12, pp. 55–59.

Peake, Harold (1916) The Origin of the Dolmen. *In Man* Vol. 16, pp. 116–121.

Peake, Harold (1919) Devolution: A Regional Movement: A Report Submitted to the Ministry of Reconstruction by a Sub-Committee Appointed by the Standing Committee on "Regional Surveys and Local Studies of the Geographical Association". *The Sociological Review* Vol. 11(2), pp. 97–110.

Peake, Harold (1922a) *The English Village: The Origin and Decay of Its Community: An Anthropological Interpretation*. London: Benn Brothers Ltd.

Peake, Harold (1922b) *The Bronze Age and the Celtic World*. London: Benn Brothers Ltd.

Peake, H.E. and Fleure H.J. (1927a) *Apes and Men: The Corridors of Time* Vol. 1. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1927b) *Peasants and Potters: The Corridors of Time* Vol. 2. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1927c) *Priests and Kings: The Corridors of Time* Vol. 3. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1927d) *Hunters and Artists: The Corridors of Time* Vol. 4. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1928) *The Steppe and the Sown: The Corridors of Time* Vol. 5. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1929) *The Way of the Sea: The Corridors of Time* Vol. 6. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1931) *Merchant Venturers in Bronze: The Corridors of Time* Vol. 7. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1933) *The Horse and the Sword: The Corridors of Time* Vol. 8. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1936) *The Law and the Prophets: The Corridors of Time* Vol. 9. Oxford: Oxford University Press.

Peake, H.E. and Fleure, H.J. (1956) *Times and Places: The Corridors of Time* Vol. 10. Oxford: Oxford University Press.

Pearson, Alistair and Heffernan, Michael (2015) Globalising Cartography? The International Map of the World, the International Geographical Union, and the United Nations. *Imago Mundi* Vol. 67(1), pp. 58–80.

Perry, Sara (2013) Archaeological Visualisation and the Manifestation of the Discipline: Model-Making at the Institute of Archaeology, London. In Alberti, B., Jones, A. and Pollard, J. (eds.) *Archaeology after Interpretation: Returning Materials to Archaeological Theory*. Walnut Creek, CA: Left Coast Press, pp. 281–303.

Pickles, John (2004) *A History of Spaces: Cartographic Reason, Mapping, and the Geo-Coded World*. New York: Routledge.

Prometheus (1947) *The Deed System: A Scheme of All-Round Development (Physical, Mental, Aesthetic, Social and Religious) for All Ages from Woodlings to Wayfarers*. The Woodcraft Way Series No 23. Ilford: H. Stone.

Raper, Henry and Fitzroy, Robert (1854) Hints to Travellers. *Journal of the Royal Geographical Society of London* Vol. 24, pp. 328–358.

Ross, Cathy and Bennett, Oliver (2015) *Designing Utopia: John Hargrave and the Kibbo Kift*. London: Museum of London.

Scott, John and Bromley, Ray (2013) *Envisioning Sociology: Victor Branford, Patrick Geddes and the Quest for Social Reconstruction*. Albany: State University of New York Press.

Sharwood Smith, Edward (1935) *The Faith of a School Master*. London: Methuen and Co. Ltd.

Smith, Pamela Jane (2009) *"A Splendid Idiosyncrasy": Prehistory at Cambridge, 1915–50*. Foreword by Colin Renfrew. BAR British Series, 485. illus. Oxford: Archaeopress, pp. vi–220.

Steel, Robert (1987a) The Beginning and the End. In Steel, Robert (ed.) 1987 *British Geography, 1918–1945*. Cambridge: Cambridge University Press, pp. 1–8.

Steel, Robert (1987b) The Oxford School of Geography. In Steel, Robert (ed.) 1987 *British Geography, 1918–1945*. Cambridge: Cambridge University Press, pp. 58–75.

Stout, Adam (2008) *Creating Prehistory: Druids, Ley Hunters and Archaeologists in Pre-War Britain*. Oxford: Blackwell.

Sweet, Rosemary (2004) *Antiquaries: The Discovery of the Past in Eighteenth Century Britain*. London and New York: Hambledon.

Thomas, Colin (2012) Evans, Emyr Estyn (1905–1989), Geographer. Dictionary of Welsh Biography, National Library of Wales http://yba.llgc.org.uk/en/s8-EVAN-EST-1905.html

Thomson, Godfrey and Haehnel, Kurt (1909) "Wandervogel": A German Society for the Promotion of School Excursions. *The Geographical Teacher* Vol. 5(1), pp. 30–32.

Thornton, Amara (2015) Social Networks in the History of Archaeology: Placing Archaeology in Its Context. In Eberhardt, Gisela and Link, Fabian (eds.) *Historiographical Approaches to Past Archaeological Research*. Berlin Studies of the Ancient World 32: Berlin.

Toye, Francis (1948) *For What We Have Received: An Autobiography*. London: A. A. Knopf.

Turnbull, David (2000) *Masons, Tricksters and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge*. London: Taylor and Francis.

Urry, James (1972) "Notes and Queries on Anthropology" and the Development of Field Methods in British Anthropology, 1870–1920. In Proceedings of the Royal Anthropological Institute of Great Britain and Ireland. No. 1972, pp. 45–57. London: Royal Anthropological Institute of Great Britain and Ireland.

Van Tilburg, Jo Anne (2005) The Mana Expedition to Easter Island (Rapa Nui): Archaeology and Ethnology in the Light of History. In Dillon, Brian D. and Boyd, Matthew A. (eds.) *Archaeology without Limits: Papers in Honor of Clement W. Meighan*. Lanchester, CA: Labyrinthos.

Venier, Pascal (2004) The Geographical Pivot of History and Early Twentieth Century Geopolitical Culture. *The Geographical Journal* Vol. 170(4), pp. 330–336.

Vidal de la Blanche, Paul (1908) *La France, Tablaeu Geographique*. Paris: Librarie Hachette.

Vidal de la Blanche, Paul (1922) *Principes de géographie humaine*. Paris: Librarie Armand Colin.

Westlake, Aubrey T. (1917) *Woodcraft Chivalry*. Second Edition. London: The Order of Woodcraft Chivalry.

Wexler, Jennifer, Bevan, Andrew, Bonnachi, Chiara, Keinan-Schoonbaert, Pett, Daniel and Wilkin, Neil (2015) Collective Re-Excavation of Lost Media form the Last Century of British Prehistoric Studies. *In Journal of Contemporary Archaeology* Vol. 2(1), pp. 126-142.

Wickstead, H. (2017) *"Wild Worship of a Lost and Buried Past": The Cult of Kata and the Enchanted Distribution Map*. Special Collection: World Histories of Archaeology. Bulletin of the History of Archaeology, Vol. 27(1), 4, pp. 1-18.

Williams, Raymond (1980) The Bloomsbury Fraction. In Williams, Raymond *Culture and Materialism: Selected Essays*. London and New York: Verso, pp. 148–170.

Williams-Freeman, J.P. (1915) *An Introduction to Field Archaeology as Illustrated by Hampshire*. London: Macmillan.

Wise, M.J. (1986) The Scott Keltie Report 1885 and the Teaching of Geography in Great Britain. *The Geographical Journal* Vol. 152(3), pp. 367–382.

Withers, Charles (2000) A Partial Biography: The Formalization and Institutionalization of Geography in Great Britain since 1887. In Durbar, G. (ed.) *Geography: Discipline, Profession and Subject since 1870: An International Survey*. Dordrecht, Netherlands and Norwell, MA: Kluwer Academic Publishers, pp. 79–119.

4 Feminist mapping for archaeologists

At the intersection of practices

Silvia Tomášková

Stumbling into a new terrain

Some four years ago I started my current archaeological research in the Northern Cape of South Africa. The project investigates ways of making petroglyphs for the insight they may provide into learning, skills and bodily practices. In an effort to build on the work of others, and to establish an easily comprehensible and visually translatable system in my records, I started by searching for distribution maps of prehistoric sites with symbolic representations in the province, and in South Africa in general. A seemingly comprehensive, if somewhat schematic, map that I came across early on was on display at the Rock Art Research Institute at Wits University in Johannesburg. It depicted the distribution of rock paintings along the coastal areas, hugging the coast in a wide U-shape, all the way up to Namibia. Petroglyphs followed the same U-pattern but were located inland, adjacent the paintings, with some limited overlap. While suspiciously neat, the map assertively demarcated areas of paintings and areas of engravings. I had no reason to question this illustration of existing sites, so prominently displayed in the gallery of the institute. Yet in subsequent conversations with local archaeologists, and whenever I gave a presentation of my work, people dismissed the clean and orderly distribution map as patently not credible. It was "just a picture", I was assured, that supposedly everyone who worked in the area knew was not representative of ground truth; it was most certainly very outdated, not a reflection of any current archaeological facts, or knowledge. Intrigued by this repeated experience, I searched for more-updated, accurate maps of sites, with no success. Publications would have schematic, localized maps that gave a general sense of the location, but were frequently so vague that I could not use them to generate a larger composite map, or even find the site, were I to take them with me to the field. I asked established South African archaeologists about the lack of a map, or even partial maps of the vast, impressive, world-renowned body of symbolic representations that I thought should have been on every lamppost.

Then with a jolt, I realized how unreflectively modernist and provincial I had been at the same time (in the sense of Chakrabarty 2000; Penny and

Bunzl 2003). After all, it would be ahistorically naïve to assume that a map was simply an obvious, straightforward record of known facts – printed, material and visible proof of the archaeological wealth of a country. This was an embarrassing epiphany, particularly given that I had lived the first two decades of my life in a totalitarian regime where maps never reflected the "whole truth", or even remotely resembled any ground truth. My father collected military maps after the collapse of the Berlin Wall, so that he could compare them to commonly available tourist maps. He delighted in pointing out all the vanished roads, misleading routes, and even structures that he had built as an engineer that remained completely invisible on most maps. Since my initial stumble into South African rock art mapping, I have had many productive and insightful conversations with local archaeologists. They were ambivalent about making, producing, or publishing maps for larger circulation, citing a range of historical, political and practical reasons. As many critical cartographers have shown, maps have always been laden with theoretical and historical baggage (e.g. Crampton and Krygier 2006; Dodge et al. 2009; Edney 2015; Pickles 2006). In the context of South Africa, a still-volatile multicultural society, with a lingering legacy of the previous apartheid regime laid over a divisive colonial history, maps remain deeply political texts.

In recognizing the obvious politics of maps and map-making in regions known for oppressive regimes, we should not assume that objectivity is the central attribute of maps in the rest of the world. As Edney (2015) convincingly argues, dissatisfaction with maps is a modernist malaise, rooted in an attachment to the belief that a map ought to be a reflection of facts on the ground: "[w]hen one is thoroughly committed to the position that maps are precise and complete statements of spatial fact, then one can easily find fault with them" (2015, p. 11). I take this point seriously (see Tomášková 2011a for an example in the context of Central Europe) and suggest that feminist mapping is a practice grounded in a particular history of archaeology and framed by a political, theoretical stand that allows overcoming this modernist impasse.

This chapter then offers an inquiry into the practice of making maps of archaeological sites as an exploration of how and why such artifacts are made in the first place. I further ask whether gender archaeology, and particularly a feminist framing of the project, might have anything productive to say about the practice. This discussion is a continuation of my earlier foray into the topic (Tomášková 2007), which sought historical insight into the broader topic of archaeological methods, how we understand "the field", and commonly used practices from a feminist perspective. At the time, I concluded that attention to practice might be the best entry point for feminist interventions, especially if gender archaeology wished to have a broader impact on archaeology in general. I will therefore explore the topic of map-making from the standpoint of feminist archaeology and argue for its generative potential.

Histories that matter

Since its inception in the nineteenth century, archaeology has been a "way of doing", a method to investigate research questions, specifically questions about the past. Well over half a century ago, Walter Taylor provided the most explicit articulation of this position when he suggested that archaeological practices are to a large degree constitutive of the field: "[Archaeology] consists of a method and a set of specialized techniques for the gathering or 'production' of cultural information" (Taylor 1948, p. 44). This position has been debated ever since, with disagreement over whether archaeology is anthropology, a form of history, or a method that contributes to both (for a more detailed discussion, see Tomášková 2007). The position I take in this debate is that whether archaeology found a domicile in departments of History, as was the case in Europe, or a home in Anthropology, the path followed in North America, methods served as a unifying feature across borders and traditions. The centrality of methodologies to answer historical or anthropological questions is also reflected in archaeology's self-definition and image; archaeologists identify by the technical specialty they are trained in, followed by the time period, and the region of the world. Only a relatively small segment of the new generation of archaeologists in the twenty-first century introduce themselves by the research questions they are interested in, as in foodways, landscape, identity, or inequality, rather than their respective methodological training. One could also point to academic job announcements for archaeologists that list technical specialty as the central feature of the successful applicant; it could be argued that terms such as "lithic specialist" or "pottery analyst" appear more often and play a more defining role than does a desire to locate an expert on the rise of inequality in a particular time period, or a specialist in landscape. It is, therefore, the methodological weave of our field that I address in a focus on a particularly common practice, mapping. Yet before we focus on mapping as a historical and a methodological approach, the history that matters as much in this conversation is that of feminism, gender and the distinctions between the two. Geographers and archaeologists may share an interest in maps. Their engagement with gender and feminist theory was, and continues to be, quite different.

Women, gender and the distance to feminism

Almost twenty-five years ago, Janet Spector (1993) engaged key issues raised by feminists in her exemplary study *What This Awl Means: Feminist Archaeology at a Wahpeton Dakota Village*, questioning categories and providing an explicit discussion of methods and her involvement with descendant communities in Little Rapids, Minnesota. Her work remains an outlier when it comes to addressing archaeological methods. Despite an extensive library and journal search, I have not been able to find other archaeologists who would describe their methodology in a field project in terms of feminist practice. Feminist approaches inspired research questions and interpretations, but methods sections showed a remarkable paucity of explicit alliance with feminist frames of reference (see Conkey 2003; Geller 2009; Moser 2007; Moss 2005; Tomášková 2011b for a review of gender-focused and feminist scholarship in archaeology). I take this to be either a sign that I was looking for a nonexistent unicorn or that I may have been looking in the wrong places. Shifting to a more interdisciplinary work frame, I looked to the domain where mapping is presumably the central practice: geography. I therefore situate this review in a larger conversation, and track resonant histories, and pay particular attention to cartography. Similarities and differences between feminist geography and archaeology reveal interesting disciplinary particularities worth exploration. Women, gender and feminist approaches have provided building blocks for innovative scholarship across a number of disciplines, and never remained the sole domain of any one scholarly field. It is thus only fitting that when looking for feminist practice, we need to cross bridges between fields.

When looking across disciplines over the past thirty years, we can draw a distinction between research that places women at the center, work that addresses gender, and inquiries that rely on feminism as a theoretical framework. The chronology of such differentiation is not uniform across all disciplines; such shifts occurred earlier in some fields, for example literary domains, sociology or cultural anthropology, whereas others have only considered such issues more recently, particularly scientific fields, including archaeology. As a number of scholars over the past two decades have pointed out, notions of scientific objectivity and claims to neutrality have retained a much stronger grip on the physical and natural sciences (see, e.g. Biagoli 1999; Bleier 1986; Haraway 1988, 1997; Harding 1991; Latour 1993; Schiebinger 2003). Archaeology, particularly New Archaeology in the Anglo-American tradition, has followed the dominant trend in this vein, fully resistant to feminism as if it were an ideological pollutant (Conkey 2003, 2005; Geller 2009; Gero 2007).

By contrast, Anglophone feminist geographers, along with academic scholars in history, political science, or sociology, started noting the absence of "women" in the field as both practicing subjects, and objects of research already in the late 1970s (see Bondi 2004; Moss and Falconer Al-Hindi 2008; Nelson and Seager 2005 for thoughtful reflections on the first decades of feminist geography). Scholarship in the 1980s brought into the open the recognition of gender inequality as a structural problem, rather than a personal experience of individuals. What started as a remedial work resulted in a wealth of studies that shifted attention to the question of who was doing, or speaking for, "human" geography, as well as who was included in the spatialization of human experiences (e.g. Bondi and Domosh 1992; Hall 2002; Hansen and Pratt 1995; Johnson 2008; Moss and Falconer Al-Hindi 2008; Nelson and Seager 2005). As with most fields, feminist discussions in geography are by no means mainstream or widespread (see Droogleever Fortuijn 2008 for an interesting approach on the margin from multiple perspectives, see also Bondi 2004; Coddington 2015; Staeheli and Martin 2000).

> Katharyne Mitchell (2011) has characterized the relationship between feminism and geography as being fundamentally *incommensurate*: geography makes boundaries, and feminism breaks them. The unsettling nature of feminist work within geography arises from the juxtaposition of its counterhegemonic intellectual politics within what is still, fundamentally, a discipline with a long history of complicity with imperial, capitalist, and White hegemony.
>
> (Coddington 2015, p. 214)

Nevertheless, compared to other social sciences, the success of feminist geography has been striking, considering the established voice in an academic journal – *Gender, Space and Culture: A Journal of Feminist Geography* – published regularly since 1994, and the recognition of feminist geography as a field (Staeheli and Martin 2000). The journal has an excellent reputation, is published by a mainstream press (Routledge), and has the same highly regarded standing in academic promotions as journals in physical or human geography. The success of a professional journal, combined with a discussion of feminism not merely as a niche interest, inspired a healthy questioning of the foundational status of gender in the new millennium. In the eyes of many, to read a dedicated feminist geographer who takes intersectionality seriously inevitably decenters gender, pays attention to multiple, temporally framed scales of power relations resulting in much greater attention to cultural constructions of difference, and a concern for justice. Greater sustained attention to global and historical processes highlighted the need to attend to local categories and practices, including gender, among others. Thus, writing about the shift "beyond gender" in the field of geography, Coddington (2015, p. 214) noted:

> One of the most contested debates within feminist scholarship and politics – and feminist geography more specifically – is the attempt to break the taken-for-granted connection between "feminist" work and a specifically gendered focus. Primarily within the Western academy, scholars have begun relying less on feminist scholarship founded upon gender inequality. Instead, scholars are employing feminisms that posit that, 'despite the affinity between feminism and empirical research with, on, and about women, there is no ontological or epistemological imperative within feminism that this need be the case'.
>
> (Moss and Falconer Al-Hindi 2008, p. 4)

Archaeologies

In the context of this chapter, with a focus on mapping, geography is a fitting counterpart to archaeology. Considering the "next of kin" history, and a disciplinary relationship; similar methodological practices, and a fieldwork ethos, archaeology and geography offer interesting insights into the theoretical location of feminism in each field. Feminist mapping plays out quite differently in these two disciplines, and thus provides an informative window into divergent paths and practices in field sciences in general.

Unlike in geography, feminist theory in archaeology continues to be a theoretical position with a small, albeit dedicated following, no independent professional journal, and a recurrent need, or urge, to justify its existence. Well over a decade after the domestication of gender archaeology, Pamela Geller used a fitting comparison when she puzzled over the absence of explicit feminist standpoint in archaeological writing:

> Such a lacuna is akin to examining class relations with nary a reference to Marx or evolution with minimal mention of Darwin. Perhaps, Simone de Beauvoir does not come as trippingly from the lips. Inattention to feminist scholarship that has ebbed and flowed over several waves – an imperfect metaphor but useful heuristic device – makes for a deficient study of the lives of past peoples, as well as an archaeological practice that increasingly has less relevance in our modern world.
>
> (Geller 2009, p. 66)

In archaeology, the distinction between gender and feminism as a theoretical framework emerged in North America in the 1990s, when gender archaeology became a topic of fairly regular conversations in graduate seminars in theoretically inclined programs. While a number of authors emphasized the importance of such distinctions from quite early on (e.g. Conkey and Gero 1997; Conkey and Spector 1984; Cullen 1996; Gero and Conkey 1991), others have smoothed over the difference, or even distanced themselves from feminism, arguing that it is either not important, passé or distracting from the larger mission of describing and understanding the past (e.g. Hegmon 2003; Hill 1998; Moore and Scott 1997; Stig Sørensen 2000). Hill, for example, suggested "an entirely new theoretical framework – what has been loosely termed 'feminist' or 'gender' theory – is at best an intellectual exercise. At worst, attempts to construct 'feminist' theory are a means of further isolating gender issues from mainstream research" (Hill 1998, p. 100). From the opposite perspective, Barbara Little spelled out the crucial difference between gender and feminism most clearly as early as 1994, with a rare appearance of the word 'feminism' in archaeological writing:

> The distinction between gender and feminism in archaeology is important in assessing the contribution of these volumes . . . Archaeology of gender implies an approach of identifying and excavating the remains of women's activities, while a feminist archaeology aims at changing whole interpretive frameworks. Feminism includes various politics directed at changing gender based power relations. A feminist archaeology contributes to this end by reexamining historical constructions and by assessing

> material conditions of gender relations. Considering gender does not and will not *necessarily* support a feminist approach.
>
> (Little 1994, p. 374, stress in original)

Madonna Moss, in response to Hegmon's (2003) claim that we can all get along under the umbrella of "processual-plus", noted that attempts to smooth out the political edges defangs theory and denies its relevant social and political history. "Feminist archaeology also occupies a theoretical space outside the processual – postprocessual opposition. A feminist archaeology is not simply a concern with gender in the past." (Moss 2005, p. 283). Even more pointedly, Moss cites Patterson to argue that to strip theory of its social context is far from an innocent act of conflict avoidance between different archaeologists or theoretical positions:

> [Archaeologists] behave like muggers who randomly select their victims, steal their ideas or methodologies and retreat with no regard for the identities of the victims, their place in social discourse or the implications of such acts, and then sell the stolen goods in the next issue of a scholarly journal [Patterson 2000, p. 51].
>
> (Moss 2005, p. 582)

To that end, archaeology, particularly in North America, currently resembles a vast ocean with many ships sailing their own course; some pass without any acknowledgment or even identification of the vessels in their vicinity, while others flash lights of recognition, but without much effort to approach. Research that acknowledges the existence of women in the past is now relatively commonplace, even if that acknowledgement itself exhausts the topic. Gender, on the other hand, has taken its place as one of the many variables in a range of theoretical approaches employed by archaeologists – Marxist, structural, critical, processual, even evolutionary archaeologies. As a matter of fact, by this point in the twenty-first century, the term *gender* has become normalized to such a degree that it frequently replaces sex as a category, an unquestioned synonym, devoid of history or politics. Yvonne Marshall aptly regretted the unthinking direction of gender archaeology:

> . . . it has generated a vast, highly particularistic and 'unreflexively [W] estern, normative and heterosexual' literature on gender (Conkey 2003, p. 876) that now outstrips 'even the most dedicated attempts at bibliographic tracking' (Joyce 2004, p. 90). This literature seldom challenges or questions the disciplinary status quo in archaeology and does not aspire to build upon contemporary feminist theorizing, although there are exceptions . . . .
>
> (Marshall 2008, p. 39)

It is, therefore, a challenge to the new generation of feminists among archaeologists to take stock of the plethora of writing on women and gender, reassess the commitment to political roots and histories of a variety of feminisms, and take it up as an ontological position (Engelstad 2007; Gero 2007; Joyce and Tringham 2007; Marshall and Alberti 2014; Wylie 2007).

It is optimistically clear from the previous discussion that when evoked in archaeological research the adjective feminist does not inevitably, or even necessarily, place gender at the center. In this chapter I continue to consider gender a useful analytical category. However, I emphasize the greater capacity of a feminist theoretical position that acknowledges multiple perspectives and experiences rooted in gendered existence, inextricably linked to differential access to power, and a strong attachment to historical and cultural analysis. This chapter offers an endorsement of an intersectional approach aware of its historical and subject positions (see e.g. Brah and Phoenix 2004; Collins 1999; Conkey 2005; Crenshaw 1989, 1991). I specifically draw on the work of Patricia Hill Collins, who addressed knowledge formation, useful for this particular feminist project. Collins (2012) provides a fitting guide to understanding practices such as mapping with gendered bodies as the starting point, but reminds us that these always operate within larger social hierarchies, intersecting with ethnicity, nationality, class, race, sexuality and historical situatedness. More importantly, they do not neatly align next to each other; rather they construct each other and reinforce existing social hierarchies:

> . . . intersectional knowledge projects acknowledge that the distinctive social locations of individuals and groups within intersecting power relations have important epistemological implications. Intersectional scholarship suggests that all knowledge, including its own, cannot be separated from the power relations in which it participates and which shape it. Because intersectional scholarship originated in a stance of critique, its practitioners often initiate intersectional projects by examining patterns of bias, exclusion, and distortion within recognized fields of study. All knowledge is constructed within and helps to construct intersecting power relations . . . .
>
> (Collins 2012: p. 453)

As Conkey (2005) gently suggests, even feminist archaeology needs to acknowledge its partial roots in a colonial, nationalist endeavor. Archaeology as a form of knowledge production historically served particular forms of power. The first step in feminist mapping as a practice then must be an acknowledgement of such historical situatedness, an active commitment to work against exclusion, and a creative engagement of diverse points of view and practices.

Making maps: performing space, imagining a place

Even a brief historical glance reminds us that maps always had a specific purpose that served multiple political, ideological and instrumental goals that operated in relations of power (see Anderson 1983 for a discussion of maps and nation building, Black 2003 for a historical overview). Cartography has always entailed a combined history of geographic space, a local place, and knowledge making. Moreover, all maps embody traces of fantasy within their depiction of reality, as they orient the world around points of local and cultural specificity, firmly rooted in history. The beauty of maps is in their representation of a given perception about what is important, as well as the desire to locate it. But they also engage in a larger work of translation of such knowledge, through circulation, exchange and frequent appropriation. Maps additionally capture a blend of representational imaginary and a practical desire for accuracy. However, the balance between the two – between fantasy and reality – proves especially interesting when a map illustrates a general idea as much as serving any immediate need for navigation, the practical purpose of a journey or a location in a larger space. This is particularly striking in indigenous map-like representations or early pre-Enlightenment maps (Chapin et al. 2005; Colwell-Chanthaphonh and Ferguson 2006; Conkey 2005; Tomášková 2013).

I, thus, turn attention to map-making in order to explore what variation of cartographies in archaeological projects might reveal. I focus less on the conceptual and interpretive aspects, and attend to the methodological possibilities. A closer look at any commonly used method offers insights into the history and logic of the discipline. It is therefore not my goal to judge currently produced and used maps as inaccurate, misleading, or failing to include the perceptions and experiences of others. Accuracy of representation is not what this chapter is about; following this logic any historical map would be deemed now useless, and we would be back to the progressivist impulse of modernity (see Edney 2015 for an extended argument). Rather, maps in this discussion are historically particular renditions of human experiences of a space. I suggest that archaeology needs more variation, rather than more precision, in representing the space of an archaeological site, and any prehistoric activities that may have taken place at the location (see also Hacıgüzeller this volume). I wish to show that a reflection on the process itself – how we define boundaries of sites and maps, who is participating, what equipment is used, and what recording standards are enforced – should be a guide to reading what is captured in a map and what is left out, providing a valuable historical and sociological record of its own. At the same time, attention to the particulars of map production allows for possible alternatives. This discussion is thus structured as a brief reflection on the history of mapping practices in archaeology (see Wickstead this volume), followed by a consideration of feminist cartographies, and their impact, or lack thereof, on the way that archaeologists go about creating maps. I suggest that back-and-forth tacking between the past and the present, a central element of archaeology's practice, poses a particular challenge, which makes a simple import of methods or approaches from other fields complicated and subject to a significant dose of caution. Attention to map-making, as a central part of fieldwork, highlights the importance of historically variable experiences of science, as well as the disciplining of bodies and vision through specific rules, traditions and technical equipment. This cultural and historical variability, in turn, has an impact on the end product, the map. Despite every effort to standardize methods, practice remains a culturally framed interpretation of training and given standards. The realization that not all maps are uniform offers the potential to notice difference and particularity in being in the world, as any review of historical or ethnographic depictions of space shows. Thus, I suggest that map-making provides an opportunity for feminist archaeology to make a valuable methodological mark, by exploring multiple ways of rendering both past and present realities visible.

How maps are made: military methods as archaeological guides

Maps that included details of archaeological materials go back to the eighteenth-century county surveys in England, as Phillips (1961) noted. Initially, the attention to antiquities in such activity was driven by Romantic visions of landscapes as material sites of the past and properties of the land-holding classes. The use of military equipment, and personnel employed in the task, is interesting with regards to the question of their omission: the early days of the surveys are marked by a complete absence of any discussion of the method itself. All bodies performing the task and all equipment were assumed to be the same and interchangeable. Moreover, antiquities collections were not the central point of the exercise; rather, they were subsumed under the military operation without as much as a comment. O.G.S. Crawford, the first official Archaeology Officer appointed to the Ordnance Survey in 1920, described the connection between military mapping and recording historical markers on the landscape, while also pointing out the curious lack of attention to methods:

> Antiquities were marked on the earliest edition of the 1-inch map begun in 1797. This map was for military purposes, and the whole energies of the Survey were concentrated on it until 1824. By this time the whole of the south of England and part of Wales had been surveyed in the field, and many engraved sheets published. In 1824 the Survey of Ireland on the 6-inch scale was begun, and the work of the 1-inch map was almost entirely suspended. During this period of twenty-seven years roughly the first quarter of the nineteenth century a large quantity of archaeological information was collected and recorded on the hand-drawn originals,

> which were on a scale of 2 inches to the mile . . . . . . There is little direct evidence of the methods employed in the field for recording antiquities. The Departmental Committee's Report of 1893 does not once mention the subject in all its 350,000 words. But there can be little doubt that the practice of a few years ago was substantially the same as in the early part of the nineteenth century.
>
> (Crawford 1922, pp. 245–246)

As Crawford observes, for the entire time, some one hundred years of duration, there seemed to be scant attention paid to the specific methods of mapping and recording antiquities, or even a possible difference between military land surveys, records of archaeological sites, or military personnel and antiquarians. The work was simply carried out with the understanding that military interests and the collection of antiquities served the same or similar goals, a record of properties and boundaries, present and past, mutually reinforcing each other. Besides the seamless fusion of military and archaeological methods and goals, colonial expansion was the additional facet of the early enterprise. The inclusion of Ireland in the early-nineteenth-century surveys was not accidental; rather it was an expression of a longstanding domination, a control mechanism specifically aimed to collect data about landholding relationships.

Angèle Smith pays specific attention to these nineteenth-century Ordnance Surveys in Ireland when she argues that the use of historical maps in archaeology should be far more reflective of the history of the maps, specifically their production by occupying British soldier–surveyors: "These maps are documents in two ways: first, they represent the colonial control over the landscape and its people; second, these maps have been used uncritically as the single authoritative truth of that colonial control" (Smith 2007, p. 83). Smith particularly objects to the use of these records by historical archaeologists, who incorporate them in interpretations as snapshots of landscape during the nineteenth century, while they ignore their production by the colonial military. Although she accepts their historic value, Smith calls for recognition of the methods by which these Ordnance Surveys were made. In the process, she argues for the necessity of treating maps as artifacts that were made through a historically particular process that can be traced, rather than transparent records or reflections of past reality. A careful excavation of the archives led her to notebooks written by the military officer, Colonel Thomas Colby, in charge of the survey, with detailed instructions on how to record. These "were meant to standardize the procedure in the field as well as the look of the final map product. These instructions set the guidelines for measuring boundaries, recording of place name orthography, and the depiction of landscape content" (Smith 2007, p. 86).

However, Smith goes further than noting the historical context of production. Specifically citing feminist geographers as her guides, she compares Colby's field instruction with the final product, a result of surveyors' interactions with the local farmers, tenants and landlords. The richness of this particular case study rests in its avoidance of a simplistic binary of colonial power versus resistance; rather it benefits from the attention it pays to the tension and distance between the survey methods and standards, and the final product, the map. Smith does not argue for these maps as a distortion of reality, rather she calls for a greater attention to mapmaking: "archaeologists must also be aware of their own role as mapmakers. In the production of archaeological interpretation, surveys and excavations depend on maps to illustrate and document the archaeologist's control over the spatial context." (Smith 2007, p. 89). Most archaeological projects, while making their own maps and sketches, rely on existing and historical maps. It would behoove to them to carry out a similar thoughtful consideration of such maps as historical artifacts that add stratigraphy to a project.

Historians of the discipline have noted archaeology's reliance on military survey and recording methods, when it emerged as a field discipline in the late nineteenth century (e.g. Diaz-Andreu 2007; Liebman and Rizvi 2008; Lucas 2012; Trigger 2006). Yet a disconnect between such recognition by historians and the enthusiastic or unreflective adoption of military techniques of surveillance by practitioners is nowhere more apparent than in widespread adoption of aerial photography in mapping, particularly in post-WWII times, and GIS technology more recently. In Britain, O.G.S. Crawford, of the Ordnance Survey fame, also popularised aerial photography in the 1920s; while subsequent enthusiasm and collaboration with the military was extensive throughout the continent: "The Second World War in Europe, rather than slowing the pace of aerial archaeology, resulted in advances in aircraft and aerial photographic techniques, and many military fliers adopted aerial archaeology as a hobby that they pursued and perfected" (Ebert 1984, p. 301). Similarly in the United States, the earliest photogrammetry "involved photomapping of enemy territory by the Union Army during the Civil War in 1862" (Ebert 1984, p. 319). I need to stress that the governmental, colonial or military nature of these maps does not automatically render them useless for archaeological purposes from an analytical and historical perspective. To the contrary, their simultaneous utility and historical value highlight the imbrication of instrumental value and history in commonly used archaeological technology. Such maps should be recognized as material artifacts produced through particular practices, rather than as purely objective, neutral measurements of spaces and places, or irrevocably tainted objects produced in a questionable context. The distance and differences between these maps and other representation of the same space lend themselves to productive conversations about map-making, visualizations and ways of being in a place.

Archaeologists continued the wholesale adoption of tools and methods developed in other fields for a diverse range of purposes through the late 1980s. Geographical Information Systems (GIS) were introduced from quantitative geography, at the time mainly used for predictive modeling, specifically related to environmental settings and conditions. GIS, in the most general terms, comprises a range of computer database programs for the storage, analysis and manipulation of spatially referenced data (Rennell 2012, p. 512). GIS has roots in military information systems, private sector research, development and marketing, as many geographers pointed out (e.g. Elwood 2010; Pickles 1995, 2006; Schuurman 2000, 2002; Schuurman and Pratt 2002). Furthermore, GIS originated in digital technology that privileges quantitative modes of representation and analysis. This initially built a barrier between representational forms and interpretive ways of reasoning. Moreover, uncritical adoption of GIS occurred at a moment in the social sciences when space and place started to be theorized as socially constructed and far more in flux than computer modeling allowed for (extended discussions in Elwood 2010; Pickles 1995; Sheppard 2005). The greatest, and in the foreseeable future insurmountable, obstacle in the area where I work is the fact that GIS requires levels of expertise and cost that excludes most potentially interested local participants. If one of the central tenets of feminist mapping is awareness and active work against established hierarchies, GIS may not be the best immediate route to take. Even a modest budget of an archaeological project dwarfs the income of the majority of households in the Northern Cape of South Africa in any given year (for a discussion of the politics of methods and equipment in economically stressed contexts, see Tomášková 2015). Anyone who works in economically unstable or fragile contexts is aware of the financial cost, and social consequences, of working with expensive high tech equipment. With low literacy levels, language barriers and high unemployment, my commitment is to the long-term sustainability of skills that I can give to my assistants.

However, on a theoretical level the central criticism of GIS was the lack of any subject position, a pretense to an objectively observable, universally valid physical reality, rendered visible through a computer model. Julian Thomas, in particular, argues that the use of GIS renders all spatial experiences sterile, framed in a positivist mold, from a 'god's eye perspective':

> . . . archaeology addressed space and place using a series of methods and technologies that were primarily visual and distanced: aerial photography, geographical information systems, or satellite imagery, for instance. These approaches produced an understanding of the land quite remote from that which would have characterised past communities, immersed and physically engaged in the landscape.
>
> (Thomas 2008, p. 1)

Thomas's central argument is that archaeology is a product of modernism that has a particular way of seeing, categorizing and controlling the world through specific modes of intervention. These are, therefore, incommensurable with any pre-modern, or prehistoric experience of the world that archaeologists were purportedly trying to reach. Gillings (2012) expresses frustration from the other side of the argument over the suitability of GIS to engage with theoretical issues in landscape archaeology: "to realise fully the potential of GIS in landscape study, we need to break away from the ultimately stifling portrayal of spatial technologies as perennial methodological adjuncts; tools continually striving to assert their relevance in the face of ever-changing theoretical whims and fancies." (Gillings 2012, p. 602). He introduced an interesting concept of affordances – "what does a particular viewing location afford in terms of area of view" (Gillings 2012, p. 609), taken from ecological psychology, to suggest possibilities of action. Gillings claims that GIS may be a worthwhile tool for the exploration of such relational situations. While finding both Gillings and Thomas's projects and arguments interesting, I propose, together with critical and feminist cartographers, including feminist GIS users, that emphasizing a multiplicity of voices and views may be a more productive intervention into the widespread use of GIS among technophilic archaeologists. Attempts to merge interpretive and methodological models, be they "ever changing theoretical whims and fancies" (Gillings 2012, p. 609) or long-term sustained arguments, seems to be still rooted in an effort to achieve a vision of past landscapes, a map of experiences of an unspecified "human subject", captured with precise technology. Hacıgüzeller (2012) offers a more intriguing way of approaching GIS in her focus on the non-representational aspects of the method (see also Colls 2012 for a similar proposition). Drawing on Latour and Deleuze, she argues that we should include GIS as one of many things, relational objects, "accounting for and embracing the differences GIS makes in archaeology, and . . . enacting fruitful relations between other forms of archaeological knowledge and those created through the technology. (Hacıgüzeller 2012, p. 257). Similarly Elwood (2010), in an effort to reposition GIS as a critical approach, suggests that the method may be thought of "not only as hardware, software, data structures, and data, but also as assemblages of accepted practices. This expanded notion of what GIS is opens the door for understanding that knowledge and ways of knowing are produced at many sites and moments in GIS use. Viewing GIS as in part constituted by its data models, for example, illustrates how different models are based on different ontological understandings of space, with implications for the ways of knowing that are possible with each" (Elwood 2010, p. 48).

Following these lines of argument, GIS is obviously not an insurmountable obstacle; rather, it requires a more thoughtful recognition of the context of production of maps through such technology (see Green this volume), particularly a socio-historical analysis of the practices and the kinds of data included and generated. Most importantly, it requires a far more imaginative layering of archaeological knowledge rather than attempts to produce a most-accurate map. Archaeologists should consider mixed methods that would combine technology with historical and local forms of knowledge rather than insist on purity of one idealized technological solution to interpretive problems of the past addressed in the present.

Feminists in the field

> "Defining feminist methodology by deciding on and then agreeing to a set of parameters that locates research within a particular politics and ethics is not a task to be taken lightly."
>
> (Moss 2005, p. 41)

Pamela Moss, one of the leading voices of feminist geography, has grappled for most of her career with the question as to what makes research, and methods in particular, feminist (see e.g. Moss 1993, 2002, 2005). Moss always located feminist methods in the historical context that produced them, including a clear-eyed view of conflicts and power differences within women's and feminist movements. However, the most convincing aspect of the approach is her consistent affirmation of politics and ethics as essential components of the method, even when her views evolved over the years, or adjusted to the topic at hand. Ultimately, methodological commonalities in feminist research concentrate on power, difference and specificity embedded in politics and history. That is a path I find most productive in field research and have followed in a current project in the Northern Cape in South Africa.

Feminist scholars in a range of fields, including archaeology, have engaged with epistemological issues of knowledge production in a reflexive manner (e.g. Collins 1999, 2012; Gero 2007, 2015; Haraway 1988, 1989, 1997; Harding 1991; Tomášková 2007; Wylie 2003, 2007). They suggested that a more-open discussion between research participants produces a more-democratic knowledge base where methods, results and interpretations can be evaluated in turn. Following this logic, a feminist mapping project lies at the intersection of historical and social positions, enacted through practice in the field. It has to be transparent about historical and political subject position of all participants, the field itself, and the products of the research. The intersectional approach, in particular, urges us to recognize the multiple social identities that construct our subject positions, and simultaneously contribute to existing hierarchies. As a white middle-class, educated woman, an Eastern European living in a Western country, I occupy a different location in my place of work in the United States where I teach feminist archaeology than when I conduct fieldwork in the Northern Cape in South Africa. Race, gender and class play out and resonate quite differently in these settings for specific historical and social reasons. I am cognizant in a physical way that I move around differently in the field in a land where I am never a local, than when I explore similarly rural areas near my home in North Carolina. In South Africa, I recognize the effects of historically oppressive regime on the bodily practices of people around me, the way they walk, the way they talk to certain people differently, the way they look at me with distrust but not animosity.

Our project in the Northern Cape in South Africa tries to be thoughtful and open about methods of research as much as about the subject matter and the interpretations. My team and I have, therefore, begun to create a range of maps that should reflect the different histories, positionalities and imaginaries of the members. Map-making is ultimately about positioning oneself in a landscape and drawing boundaries to suggest a place. Where we locate those boundaries depends as much on the questions, as on the way of seeing and being in that space. Landscape is an entity, an active agent in shaping past and present ways of being in a place. It is, therefore, imperative that we proceed with much greater attention to power, difference and specificity in equal measure in the moment of recording the space. Locally hired field assistants see and imagine the place, the present landscape and the archaeological sites very differently than I do. None of us is truly native to the world of these prehistoric engravings, but we have different relations to the local landscape. This is not to suggest a radical ontological difference between us, since we are working on a joint project and I provide guidance to the work we do. However, the power difference in the field, no matter how good-natured our relationship may be, is understood by all of us. They are paid workers, hired to carry out a task that they hope will be satisfactory. It took several seasons of collaboration to find a level of comfort that I can ask for drawings of the place and the sketches differ from mine in small, and some larger ways. In this project I view maps as representations of a perception about what is important and the desire to locate it. The specificity of the maker – be that my own product, the sketch of my assistant, a historical colonial map or a modern GIS map – is significant, as each adds a layer to the stratigraphy of this map-making. Each draws the boundary slightly differently, each captures different level of detail, and it is the composite nature of such recording that may offer insights into ways of seeing the same place. Therefore, while I agree with Thomas (2008) that modernist computer-generated recordings of the site in the Northern Cape from a satellite may not bring us closer to the experience of the landscape by prehistoric San groups, I would incorporate rather than reject their results. It is not the purity of experience that a feminist mapping project such as this aims to achieve; rather, it is the messiness of difference in seeing, being and recording the space that brings us closer to human experiences of the place.

Conclusion

How is a "feminist way of doing" research different from other critical, radical or socially conscious approaches? The specific social location we occupy as researchers, as members of particular groups and communities ground our standpoint; it is the locus of knowledge production, as well as our practices, bodily comportments, ways of seeing, hearing and capturing the world. Feminist mapping differs from critical cartography in its explicit acknowledgement of such subject/bodily position in conducting fieldwork; in Rachel Colls's (2012) words: "the provisional coming together of a range of forces that are material, affectual, temporal, social, political, economic, technological and so on . . ." (Colls's 2012, p. 431). Furthermore, such a project clarifies that creating maps in/of a place may be an individual experience, but it is located in a larger web of history and a social context that is neither stable nor fixed.

Work over the last two decades in the history and social studies of science has focused not just on scientific work as a form of representation but also as a practice, in the form of an assemblage of skills, tinkering, and intervention by scientists and their equipment, all of which have to be learned and performed, occasionally perfected, and often improvised (Biagoli 1999; Knorr-Cetina and Mulkay 1983; Latour 1993; Pickering 1992). In the context of archaeology, I suggest that we broaden the circle of participating "scientists" to include also field assistants and historical producers of technologies and materials we use in the field. Rather than treating feminist archaeological mapping as a unified project defined by a singular epistemological approach, my work considers the particular actions that different participants undertake in efforts to complete a task. It is the space between standard methods, historical and local facts, and their performance at a particular historical time and location that allows us to find traces of history, politics and varying differentiated bodies in action.

> *Visiting*
>
> In the shape of a human body
> I am visiting the earth;
> the trees visit
> in the shape of trees.
> Standing between the onions
> and the dandelions
> near the ailanthus and the bus stop,
> I don't live more thoroughly
> inside the mucilage of my own skull
> than outside of it
> and not more behind my eyes
> than in what I can see with them.
> (Mörling 1999, p. 9)

References

Anderson, B. (1983). *Imagined Communities*. London: Ed. Verso.

Biagoli, M. (ed.) (1999). *The Science Studies Reader*. New York: Routledge.

Black, J. (2003). *Visions of the World: A History of Maps*. London: Mitchell Beazley.

Bleier, R. (ed.) (1986). *Feminist Approaches to Science*. New York: Pergamon Press.

Bondi, L. (2004). 10th anniversary address: For a feminist geography of ambivalence. *Gender, Place and Culture* 11 (1), 3–15.

Bondi, L. and M. Domosh (1992). Other figures in other places: On feminism, postmodernism and geography. *Environment and Planning D: Society and Space* 10, 199–213.

Brah, A. and A. Phoenix (2004). Ain't I a woman? Revisiting intersectionality. *Journal of International Women's Studies* 5(3), 75–86.

Chakrabarty, D. (2000). *Provincializing Europe: Postcolonial Thought and Historical Difference*. Princeton, NJ: Princeton University Press.

Chapin, M., Z. Lamb, and B. Threlkeld (2005). Mapping indigenous lands. *Annual Reviews of Anthropology* 34, 619–638.

Coddington, K. (2015). Feminist geographies "beyond" gender: De-coupling feminist research and the gendered subject. *Geography Compass* 9(4), 214–224.

Collins, P. H. (1999). Moving beyond gender: Intersectionality and scientific knowledge, in M. M. Ferree, J. Lorber, and B. B. Hess (Eds.) *Revisioning Gender* (pp. 261–284). Thousand Oaks, CA: Sage.

Collins, P. H. (2012). Social inequality, power, and politics: Intersectionality and American pragmatism in dialogue. *The Journal of Speculative Philosophy* 26(2), 442–457.

Colls, R. (2012). Feminism, bodily difference and non-representational geographies. *Transactions of the Institute of British Geographers* 37(3), 430–445.

Colwell-Chanthaphonh, C. and T. J. Ferguson (2006). Memory pieces and footprints: Multivocality and the meanings of ancient times and ancestral places among the Zuni and Hopi. *American Anthropologist* 108(1), 148–162.

Conkey, M. W. (2003). Has feminism changed archaeology. *Signs* 28(3), 867–880.

Conkey, M. W. (2005). Dwelling at the margins, action at the intersection? Feminist and indigenous archaeologies. *Archaeologies* 1(1), 9–80.

Conkey, M. W. and J. M. Gero (1997). Programme to practice: Gender and feminism in archaeology. *Annual Reviews in Anthropology* 26, 411–437.

Conkey, M. W. and J. D. Spector (1984). Archaeology and the study of gender. *Advances in Archaeological Method and Theory* 7, 1–38.

Crampton, J. and J. Krygier (2006). An Introduction. *ACME: An International E-Journal for Critical Geographies* 4(1), 11–33.

Crawford, O. G. S. (1922). Archaeology and the ordnance survey. *The Geographical Journal* 59(4), 245–253.

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine. *University of Chicago Legal Forum*, 139–168.

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review* 43(6), 1241–1299.

Cullen, T. (1996). Contributions to feminism in archaeology. *American Journal of Archaeology* 100(2), 409–414.

Diaz-Andreu, M. (2007). *A World History of Nineteenth-Century Archaeology: Nationalism, Colonialism and the Past*. New York: Oxford University Press.

Dodge, M., R. Kitchin, and C. Perkins (eds.) (2009). *Rethinking Maps: New Frontiers in Cartographic Theory*. London: Routledge.

Droogleever Fortuijn, J. (2008). Balancing the margin and the mainstream, in P. Moss and K. Falconer Al-Hindi (Eds.) *Feminisms in Geography: Rethinking Space, Place, and Knowledge* (pp. 75–83). Lanham, MD: Lanham-Roman and Littlefield Publishers Inc.

Ebert, J. (1984). Remote sensing applications in archaeology. *Advances in Archaeological Method and Theory* 7, 293–362.

Edney, M. (2015). Cartography and its discontents. *Cartographica* 50(1), 9–13.

Elwood, S. (2010). Thinking outside the box: Engaging critical geographic information systems theory, practice and politics in human geography. *Geography Compass* 4(1), 45–60.

Engelstad, E. (2007). Much more than gender. *Journal of Archaeological Method and Theory* 14, 217–234.

Geller, P. (2009). Identity and difference: Complicating gender in archaeology. *Annual Reviews in Anthropology* 38, 65–81.

Gero, J. M. (2007). Honoring ambiguity, problematizing certitude. *Journal of Archaeological Method and Theory* 14, 311–327.

Gero, J. M. (2015). *Yutopian: Archaeology, Ambiguity and the Production of Knowledge in Northwest Argentina*. Austin: University of Texas Press.

Gero, J. M. and M. Conkey (eds.) (1991). *Engendering Archaeology*. Oxford: Blackwell.

Gillings, M. (2012). Landscape phenomenology, GIS and the role of affordance. *Journal of Archaeological Method and Theory* 19(4), 601–611.

Hacıgüzeller, P. (2012). GIS, critique, representation and beyond. *Journal of Social Archaeology* 12(2), 245–263.

Hall, J. (2002). The next generation: Can there be a feminist geography without gender? *The Great Lakes Geographer* 9(1), 19–27.

Hansen, S. and G. Pratt (1995). *Gender, Work, and Space*. East Sussex: Psychology Press.

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies* 143, 575–599.

Haraway, D. (1989). *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York: Routledge.

Haraway, D. (1997). *Modest_Witness@Second_Millenium: FemaleMan ©_ Meets_ OncoMouse™*. New York: Routledge.

Harding, S. (1991). *Whose Science? Whose Knowledge? Thinking from Women's Lives*. Ithaca, NY: Cornell University Press.

Hegmon, M. (2003). Setting theoretical egos aside: Issues and theory in North American archaeology. *American Antiquity* 8(2), 213–243.

Hill, E. (1998). Gender-informed archaeology: The priority of definition, the use of analog and the multivariate approach. *Journal of Archaeological Method and Theory* 5(1), 99–128.

Johnson, L. (2008). Re-placing gender? Reflections on 15 years of gender, place and culture. *Gender, Place and Culture* 15(6), 561–574.

Joyce, R. (2004). Embodied subjectivity: Gender, femininity, masculinity and sexuality, in L. Meskell and R. W. Preucel (Eds.) *A Companion to Social Archaeology* (pp. 82–95). Oxford: Blackwell.

Joyce, R. and R. Tringham (2007). Feminist adventures in hypertext. *Journal of Archaeological Method and Theory* 14, 328–358.

Knorr-Cetina, K. and M. Mulkay (eds.) (1983). *Science Observed: Perspective on the Social Studies of Science*. London: Sage Publications.

Latour, B. (1993). *We Have Never Been Modern*. Cambridge: Harvard University Press.

Liebmann, M. and U. R. Rizvi (2008). *Archaeology and the Postcolonial Critique*. Lanham, NY: Altamira Press.

Little, B. (1994). Consider the hermaphroditic mind: Comment on "The interplay of evidential constraints and political interests: Recent archaeological research on gender". *American Antiquity* 59(3), 539–544.

Lucas, G. (2012). *Understanding the Archaeological Record*. Cambridge; New York: Cambridge University Press.

Marshall, Y. (2008). Archaeological possibilities for feminist theories of transition and transformation. *Feminist Theory* 9(1), 25–45.

Marshall, Y. and B. Alberti (2014). A matter of difference: Karen Barad, ontology and archaeological bodies. *Cambridge Archaeological Journal* 24(1), 19–36.

Mitchell, K. (2011, April). Feminist geography re-examined: Topical considerations, epistemological frameworks, methodological approaches. A panel discussion at the Annual Association of American Geographers, Seattle, WA.

Moore, J. and E. Scott (eds.) (1997). *Invisible People and Processes: Writing Gender and Childhood into European Prehistory*. Leicester: Leicester University Press.

Mörling, M. (1999). *Ocean Avenue*. Kalamazoo, MI: Western Michigan University Press.

Moser, S. (2007). On disciplinary culture: Archaeology as fieldwork and its gendered associations. *Journal of Archaeological Method and Theory* 14, 235–263.

Moss, M. (2005). Rifts in the theoretical landscape of archaeology in the United States: A comment on Hegmon and Watkins. *American Antiquity* 70(3), 581–587.

Moss, P. (1993). Introduction: Feminism as method. *Canadian Geographer* 37(1), 48–49.

Moss, P. (ed.) (2002). *Feminist Geography in Practice: Research and Methods*. Oxford: Blackwell.

Moss, P. (2005). A bodily notion of research: Power, difference, and specificity in feminist methodology, in L. Nelson and J. Seager (Eds.) *A Companion to Feminist Geography* (pp. 41–59). Oxford: Blackwell Publishing.

Moss, P. and K. Falconer Al-Hindi (eds.) (2008). *Feminisms in Geography: Rethinking Space, Place, and Knowledges*. Lanham, MD: Lanham-Roman and Littlefield Publishers Inc.

Nelson, L. and J. Seager (eds.) (2005). *A Companion to Feminist Geography*. Oxford: Blackwell Publishing.

Patterson, T. (2000). Archeologists and historians confront civilization, relativism, and poststructuralism in the late twentieth century, in A. Dirlik, V. Bahl, and P. Gran (Eds.) *History after the Three Worlds: Post-Eurocentric Historiographies* (pp. 49–64). New York: Rowman & Littlefield.

Penny, G. and Bunzl, M. (2003). *Worldly Provincialism: German Anthropology in the Age of Empire*. Ann Arbor: University of Michigan Press.

Phillips, C. W. (1961). The ordnance survey and archaeology, 1791–1960. *The Geographical Journal* 127(1), 1–7.

Pickering, A. (ed.) (1992). *Science as Practice and Culture*. Chicago: University of Chicago Press.

Pickles, J. (1995). Representations in an electronic age: Geography, GIS, and democracy, in J. Pickles (Ed.) *Ground Truth: The Social Implications of Geographic Information Systems* (pp. 1–30). New York: Guilford.

Pickles, J. (2006). On the social lives of maps and the politics of diagrams: A story of power, seduction, and disappearance. *Area* 38, 347–350.

Rennell, R. (2012). Landscape, experience and GIS: Exploring the potential for methodological dialogue. *Journal of Archaeological Method and Theory* 19(4), 510–525.

Schiebinger, L. (2003). Introduction: Feminism inside the sciences. *Signs: Journal of Women in Culture and Society* 28(3), 860–866.

Schuurman, N. (2000). Trouble in the heartland: GIS and its critics in the 1990s. *Progress in Human Geography* 24, 564–590.

Schuurman, N. (2002). Women and technology in geography: A cyborg manifesto. *The Canadian Geographer* 46, 258–265.

Schuurman, N. and G. Pratt (2002). Care of the subject: Feminism and critiques of GIS. *Gender, Place and Culture* 9, 291–299.

Sheppard, E. (2005). Knowledge production through critical GIS: Genealogy and prospects. *Cartographica: The International Journal for Geographic Information and Geovisualization* 40(4), 5–21.

Smith, A. (2007). Mapped landscapes: The politics of metaphor, knowledge, and representation on nineteenth-century Irish Ordnance Survey maps. *Historical Archaeology* 41(1), 81–91.

Spector, J. (1993). *What This Awl Means: Feminist Archaeology at a Wahpeton Dakota Village*. St. Paul: Minnesota Historical Society Press.

Staeheli, L. A. and P. M. Martin (2000). Spaces for feminism in geography. *The Annals of the American Academy of Political and Social Science* 571, 135–150.

Stig Sørensen, M. L. (2000). *Gender Archaeology*. Cambridge, UK: Cambridge University Press.

Taylor, W. (1948). *Study of Archaeology*. Memoir Series of the American Anthropological Association 69. Menasha, WI: American Anthropological Association.

Thomas, J. (2008). On the ocularcentrism of archaeology, in J. Thomas and V. O. Jorge (Eds.) *Archaeology and the Politics of Vision in a Post-Modern Context* (pp. 1–12). Cambridge: Cambridge Scholar Publishing.

Tomášková, S. (2007). Mapping a future: Archaeology, feminism, and scientific practice. *Journal of Archaeological Method and Theory* 14, 264–284.

Tomášková, S. (2011a). Landscape for a good feminist: An archaeological review. *Archaeological Dialogues* 19(4), 109–136.

Tomášková, S. (2011b). Archaeology in a middle country, in L. Ložný (Ed.) *Comparative Archaeologies: A Sociological View of the Science of the Past* (pp. 221–242). New York: Springer.

Tomášková, S. (2013). *Wayward Shamans: A Prehistory of an Idea*. Berkeley, CA: University of California Press.

Tomášková, S. (2015). Digital technologies in context: Prehistoric engravings in the Northern Cape, South Africa. *Digital Applications in Archaeology and Cultural Heritage* 2, 222–232, Elsevier Publishers. http://dx.doi.org/10.1016/j.daach.2015.04.001

Trigger, B. (2006). *A History of Archaeological Thought*. Cambridge: Cambridge University Press.

Wylie, A. (2003). Why standpoint matters, in R. Figueroa and S. Harding (Eds.) *Science and Other Cultures: Issues in Philosophies of Science and Technology* (pp. 26–48). London: Routledge.

Wylie, A. (2007). Doing archaeology as a feminist: Introduction. *Journal of Archaeological Method and Theory* 14, 209–216.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Part 2

Practices of mapping

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

5 The eye of the beholder

Experience, encounter and objectivity in archaeo-topographical survey

Michael Fradley

Introduction

A potential result of any physical human action involving the ground, whether it is the digging of a ditch, raising a barrow or the ploughing of an area of land, can be the creation of what, in the UK, is traditionally termed an *earthwork*. So when we discuss archaeological earthworks in the UK, we can be denoting any visible topographical elements of archaeological origin, from the ramparts of a hillfort, the terraces of a medieval lynchet or the remnants of a military trench. Rather than simply denoting a 'work of earth', the archaeological usage of this term is more of a catch-all for any topographical feature that can be distinguished as 'human-made' rather than 'natural' in origin. So the low remains of a medieval masonry wall that has fallen into disuse and progressively become grassed over would still be recorded as an earthwork, as would the depression of a former in-filled masonry-walled well, despite not technically being a pure work of earth at all. In a similar vein, the mound of a stone cairn would still be recorded and given equal prominence as part of an *earthwork survey*. The term creates further confusion through its use in the construction industry, which notably overlaps with commercial archaeology in the UK, to describe earth moving operations as part of a building development. Internationally, the term earthwork is not universally used or even understood; for example, in Brazil comparable features such as mounds and earthen-banked enclosures would be described as mounded architecture (Iriarte et al. 2008). For these reasons and to avoid further confusion, this paper will discuss 'earthwork' features as *archaeo-topography*, which is defined as topographical features that can be identified on the ground surface, either visually or a via a technical surveying method and that can be interpreted as archaeological in origin. The 'topography' element is particularly important, as it is more intelligible to archaeologists internationally than is the term *earthwork*.

Through the mapping of archaeo-topographical features it is possible to develop a detailed understanding of an archaeological site or wider archaeological landscapes, depending on where the practitioner argues is the distinction between on- and off-site. As is the case with other non-interventional techniques, such as geophysical survey, this can be achieved without recourse to the destructive process of excavation, and while it cannot produce the vertical depth of stratigraphic excavation, it can provide a horizontal spread that can be depicted by a traditional mapped format. By the careful mapping of features it is possible to demonstrate relative chronology in circumstances where, for example, one archaeo-topographical feature overlies another, for instance in the succession of fortified late-prehistoric/Roman enclosures identified at Charterhouse (Fradley 2009, 115–156). It is important to highlight at this stage that archaeo-topographical features are directly comparable to those encountered as part of an archaeological excavation. In an excavation we excavate the fills of cut features, such as ditches or pits, or the layers of built features, such as banks or platforms, and the archaeo-topographical feature simply reflects these elements where they have not been removed or covered by subsequent activity, like ploughing or construction.

Archaeo-topographical landforms are created by human activity whose physical survival is dependent on subsequent processes of human and physical geography. These forms can be morphologically simple, such as banks, ditches and mounds, or amorphous and difficult to interpret, depending on the nature of their construction and the conditions of their morphological history (Figure 5.1). They may be found in relatively simple form, as with

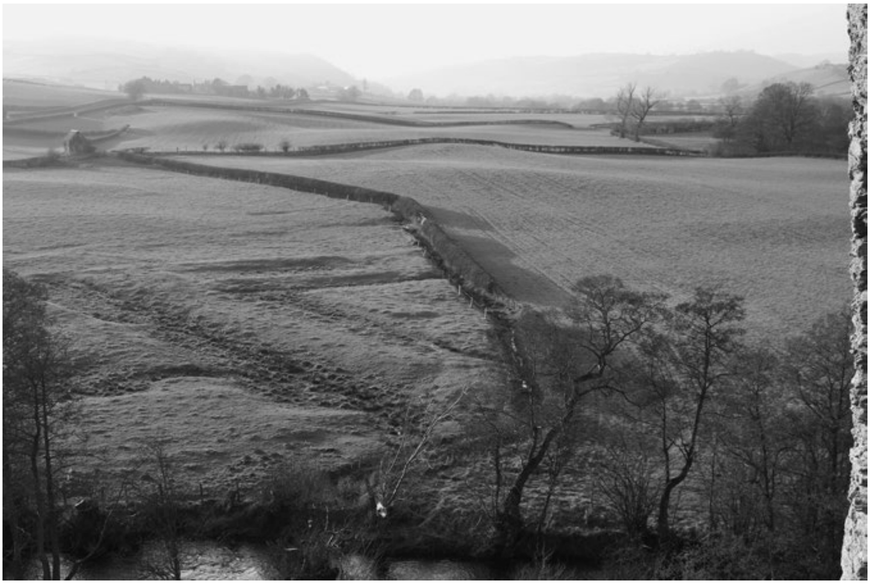


Figure 5.1 An example of differential archaeo-topographical preservation at Clun Castle, Shropshire (UK). The rectangular earthwork enclosure, interpreted as a garden feature, has been partially removed by intensive cultivation on the right hand side of the image (Photo: Michael Fradley)

an isolated earthwork barrow, or be more complex and spatially extensive in the case of entire settlements and associated features (e.g. McOmish et al. 2002; Fradley 2009). A detailed study of these features offers an effective means of understanding the extent and potential time depth of an archaeological site where any form of earthworks survive, as well as in the interpretation of the spatial arrangement of past human environments. So there are two overlapping themes in play when we take the decision to map archaeo-topographical features, as in so many areas of archaeological fieldwork. These are the needs of heritage management and research, that is, respectively, the need to create an accurate model of a site in order to monitor change or preserve by record where a site is to be irrevocably lost, and the situation where survey is conducted in order to alter our perspective and understanding of an archaeological feature. The failure to engage in mapping archaeo-topographical features consistently thus deprives the field of a significant set of data for both research and heritage management purposes.

The surface form of an archaeo-topographical feature is a significant source of data in itself, and archaeologists have taken on a variety of approaches to mapping them. Aerial photography has proved particularly effective as a means of identifying and interpreting archaeo-topography as it provides perspective across a site (e.g. Darvill 1996; Kennedy and Bewley 2004), and has the added benefit of observing surviving upstanding features alongside cropmarks/soilmarks that may denote demolished or sub-surface features (Bowden 1999, 105–118). The use of satellite imagery and other remote-sensing techniques is now widespread in archaeology (Parcak 2009), while the increasing availability of Light Detection and Ranging (LiDAR) data is encouraging a greater appreciation of archaeo-topographical features, and being used in cases such as the investigation of medieval castles that would previously have been mapped as part of a ground survey (Swallow 2016). Ground surveys can be conducted by collecting height data using one of a number of tools, such as an optical level, total station or differential GPS, resulting in the mapping of archaeo-topographical features in any preferred form, such as a contour or digital terrain model. In the UK, a particular type of ground survey has developed, known as analytical earthwork survey, which will be the subject of this chapter.

The number of practitioners undertaking detailed mapping and representation of archaeo-topographical forms using analytical earthwork survey as part of archaeological research in the UK has declined in recent decades. A key factor in this has been the failure of practitioners of analytical earthwork survey to adopt a sufficiently objective position to satisfy trends within the wider realms of archaeological practice. Another related issue is the lack of a consistent strategy within the commercial developer-funded world to acknowledge the steady degradation of archaeo-topographical features as an impact of development and agricultural practice, in contrast to the efforts to preserve sub-surface deposits through record. The present chapter will explore some of the factors that lie behind this declining trend in mapping archaeo-topographical features, particularly in terms of the inconsistent attempt to attain so-called ‘objectivity’ in archaeological fieldwork. In turn, it will consider how technological developments offer a means to reverse this trend. However, it is important that the rigorous interpretive framework that has underpinned the analytical earthwork survey method should not be lost, as without it the impact of these new technological systems and the importance of a mapping culture in archaeology could be significantly lessened (see also Poller, Hacıgüzeller this volume).

Earthwork survey and field archaeology in the UK

Bowden and McOmish (2011) provide a detailed account of the development of archaeo-topographical mapping techniques in the UK, arguing that there is a distinct tradition of analytical earthwork survey that can be traced back as a methodology to various sources in the eighteenth and nineteenth centuries. The analytical earthwork survey approach was developed during the 20th century by building on cartographic techniques developed by organisations such as the archaeological division of the Ordnance Survey. Chronologically, it can be broadly stated that the potential for this interpretive mapping process began to develop most effectively from the 1970s, leading to more thematic studies that provided ground-breaking research in areas such as medieval settlement studies (e.g. Taylor et al. 1990; Everson et al. 1991). The history and practice of this analytical approach have been covered elsewhere and it is not my intention to explore them here (Bowden 1999; Bowden and McOmish 2011). Instead, I would like to stress that at its core it is a method that produces a two-dimensional map of an earthwork by visually breaking down its form into a composite of separate slopes. Earthworks are identified and recorded visually by any appropriate technique of spatial measurement, and traditionally the direction and scale of earthwork slope is depicted via a hachure symbolisation (Figure 5.2). The archaeo-topographical features are in a sense broken down in the field into individual components like the pieces of a jigsaw puzzle, and re-assembled as part of an interpretive process, not unlike the deconstruction and reconstruction of sub-surface stratigraphy encountered as part of a typical excavation.

It is important to note at this stage that analytical earthwork survey practice in the UK has centred on the visual analysis of archaeo-topographical features, that is they are identified in the first instance by eye from a ground or elevated perspective. The interpretation process is engaged from the beginning, so that the surveyor(s) work through and revise an interpretation of the archaeo-topographical features as the work progresses, rather than creating an artificial distinction between the different stages of data collection, and then analysis and then interpretation. It could be argued that this is unusual insofar as the practice of mapping itself is fully grounded as it takes place not at a distance (temporal or geographical) but during the act of interpretation itself. This parallels the recording of a deposit context by an excavator, where

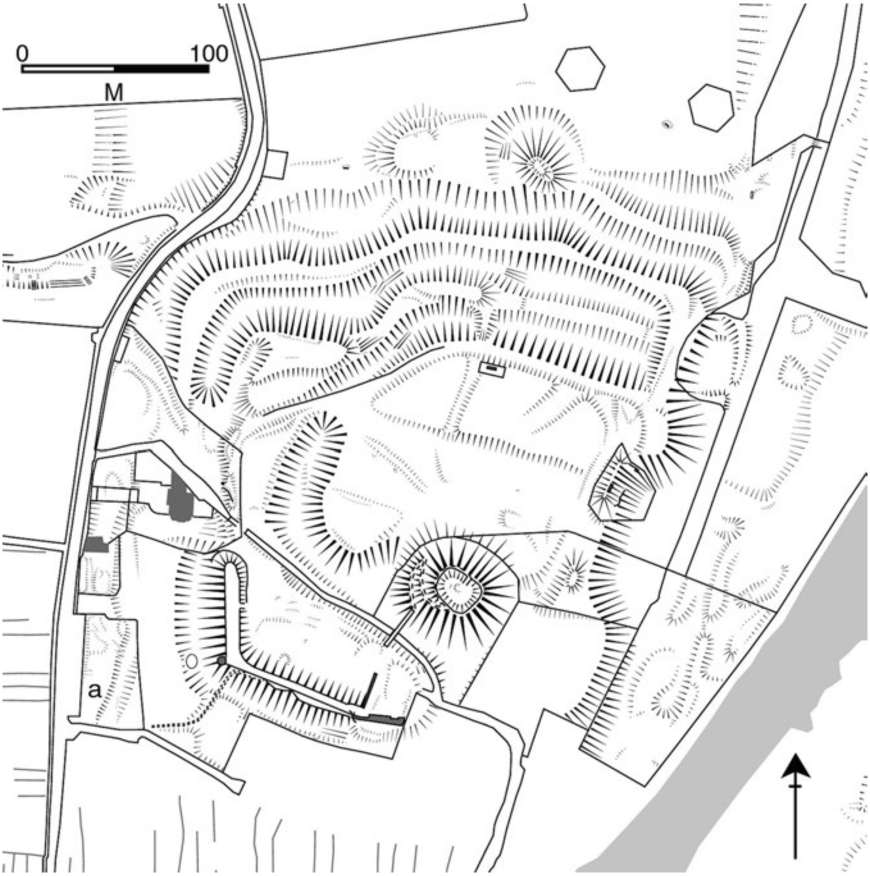


Figure 5.2 A hachure archaeo-topographical plan from Wallingford Castle, Oxfordshire (UK). Detailed investigation of the site during survey has allowed a complex narrative of site phasing and function to be developed.

context interfaces are identified both visually and by feel, so distinctions are made through the use of human senses, and some level of interpretation is made by the excavator and noted in context records. Through the gathering of experience and 'living with the site' (Bowden 1999), the surveying practitioner gets their 'eye' in, as with other forms of fieldwork such as excavation and fieldwalking, and in time it becomes easier to identify and 'unpick' archaeo-topographical features (see Poller, this volume).

It is essential to understand that the entwinement of the subjective interpretive process with the mapping method was consciously achieved. There was no disconnect between surveyor and cartographer; the actual practice of making the map enabled a rigorous process of interpretation to take place. The negative was that it detracted, particularly as archaeological recording more broadly became professionalised, from any claim that surveyors were producing an objective record of a site's form, and the question therefore was this: did the ends (in terms of highly stimulated research debate) justify the means? For many, particularly those wanting to promote the empirical credentials of archaeology as a distinct discipline from other historical or anthropological subjects, the answer was an indifferent no (e.g, Barker 1993).

In parallel with other forms of archaeological fieldwork, particularly excavation, where the human element directly interfaces with evidence that itself emerges at multi-scalar and multi-temporal levels, there is an interesting emotive cycle that accompanies the data-gathering and interpretation process in analytical earthwork survey. An initial sense of excitement at the potential of a new survey gives way to a despondent crash as the practitioner encounters the archaeo-topographical features to be recorded and finds them complex, amorphous and nonsensical, particularly on extensive multiple-phased sites. Persevering, the endorphins rise again as the features are characterised, and embryonic notions of the potential of what is being revealed and its research value begin to formulate. Emerging understanding can then break down as the complexity of the site is viewed as a whole, and any ideas of an interpretive 'narrative' become fragmented. Finally, the survey model is systematically analysed and those original interpretive strands are reformulated to rebuild a coherent, if subjective, interpretation of an archaeo-topographical complex's development (see also Poller this volume). In this condensed form, the description of this survey practice as an emotional rollercoaster seems exaggerated, but the interpretive process gains much through being experiential, not least in terms of the opportunities it offers for reflection on what is being mapped and its landscape setting.

While archaeological mapping methods have developed significantly, most notably in the macro-scale analysis through the adoption of GIS applications in archaeology, the recording of archaeo-topographical features has been applied inconsistently. The practice of analytical earthwork survey has not been supported significantly in either the academic or commercial sectors (Bowden and McOmish 2011, 28–30), in spite of the bar set in landscape research by its limited number of practitioners (e.g. McOmish et al. 2002; Jamieson 2015). In the current environment it is primarily limited to specific national research units, such as the former Archaeological Survey and Investigation team at Historic England, which incorporates elements of the former Royal Commission on Historic Monuments in England (RCHME) and the Ordnance Survey Archaeology Division, as well as units that continue to practice at the Royal Commission on Ancient and Historic Monuments in Scotland (RCAHMS – now part of Historic Environment Scotland) and Wales (RCAHMW). The time that these increasingly small units spend undertaking archaeo-topographical mapping in the field has been in consistent decline over the last two decades.

There is no single reason for the decline in the practice of archaeo-topographical survey in the UK and it is interesting to note that in 2013 a 'Landscape Survey Group' (landscape.org) was formed in part to preserve and perpetuate this craft knowledge. It is certainly open to accusations of elitism, as there has been a tendency to suggest that only certain people can 'see' the complex subtleties of archaeo-topographical features. A position such as this would be discriminatory, and is more likely to relate to a failure of practitioners to teach in a way that is effective for the needs of individual students, rather than certain people lacking a fundamental capacity to visualise these features. There has also been a failure to respond effectively to legitimate criticisms of the difficulty for the non-specialist to comprehend complex hachure maps (Wheatley and Gillings 2002, 108–109; Bowden and McOmish 2011, 32). The abstract form of the hachure plan can also be bemusing to an audience that has not had it sufficiently explained, especially in the case of particularly dense complexes of archaeo-topographical features. It could also be argued that its case has not been supported more widely in the discipline because non-specialists could take the visual recording style it employs as being openly critical. By this, I mean that while techniques such as geophysical or aerial survey create data that could not have been accessed by the individual on the ground, visual survey simply maps what can be seen on the ground, the implication being that other archaeologists working in the same area could potentially have failed to identify features that are, rather awkwardly, right in front of them. One recurrent theme within the whole surveying/mapping debate is the issue of objectivity, and it is to this that the discussion now turns.

Objectivity in archaeological surveying

The discussion on objectivity was mirrored by the development of rigorous, objective standardisation of data collection in archaeology in the UK during the late twentith century. Johnson highlights the contrast between the earthwork survey methodology utilised in the UK and that traditionally deployed throughout the rest of the world, namely contour survey (Johnson 2006, 93). A key distinction between the two techniques is one of objectivity; while analytical earthwork survey is openly subjective in its practice, contour survey is based upon an objective ideal through which height readings are theoretically taken systematically over a given spatial area, and a topographical model is built from that raw data.

In the wake of the New Archaeology, with its insistence on objective and explicit data collection (Roskams 2001, 30–34), came the development of field practices that had little relation to the traditional practice of analytical earthwork survey. In his analysis of pre-excavation field techniques, Philip Barker, one of the leading proponents of the complete excavation method, did not even discuss analytical earthwork survey, preferring instead to advocate the deployment of contour survey to provide an accurate representation of site topography (Barker 1993, 60). This is despite his books including reproductions of a number of hachured site plans (Higham and Barker 1992; Barker 1993). Interestingly, in a figure note relating to a contour survey Barker was forced to acknowledge that the data and its pictorial depiction largely failed to identify earthwork features clearly visible on the ground, so that while analytical earthwork survey was deemed not worth discussing, the alternative of contour survey was clearly felt to be ineffective in terms of recording subtle archaeo-topography and is, in fact, used infrequently in field archaeology in the UK for that very reason (Barker 1993, 53).

Barker's interest in the subject is devoted primarily to the process of archaeological excavation rather than wider forms of archaeological survey, yet his aversion to analytical earthwork survey speaks volumes. The drive towards objectivity even saw the hachure removed as much as possible from the excavation site plan, with contours utilised to depict features (e.g. Barker 1993, 191). The practical realities of excavation meant that the time-consuming effort of recording features as contour models was largely ignored, with the majority opting for a hachure symbology to denote the slope of cut features, just as in analytical earthwork survey (Drewett 1999, 130–133). It could be argued that one result of this push towards objectivity by archaeologists such as Barker during the early stages of professional/commercial development in the discipline has been a failure to include analytical earthwork survey techniques in the evolving forms of rescue archaeology currently being practiced. A consequence of this is that there has been no acceptance of the inherent subjectivity of the technique comparable to that witnessed in the more-prominent field of excavation (Edgeworth 2003). This divergence is important, as the archaeo-topographical features recorded are ground level manifestations of the same stratigraphical deposit build-ups as the features recorded through excavation. As with the subjective recording of archaeo-topography, the standard practice of excavation in the UK is based upon the visual identification of context change by the excavator (i.e. a subjective interpretation). In this sense it is curious that it has been the subjective nature of archaeo-topographical survey that has left it so maligned, while comparable practice in excavation has been widely embraced (Edgeworth 2003).

While the forms of archaeological practice advocated by Barker were not taken up widely in the UK, the limited value he ascribed to archaeo-topographical survey as a pre-excavation method has been continued by subsequent commentators. Despite discussion of a range of pre-excavation techniques, including aerial photographic analysis and remote sensing, Roskams gives no space to earthwork survey of any form, despite an emphasis on the importance of the pre-excavation phase for improving the success of any excavation (2001, 42). Carver's volume on archaeological fieldwork loosely identifies the role of earthwork survey, and importantly notes its symbiotic value in combination with other techniques, although it also erroneously claims that its chief practitioners have failed to produce any form of manual or guide to the technique of analytical earthwork survey (Carver

2009, 91–92, 102–103; for the contrary existence of field manuals, see e.g. Taylor 1974; Bowden 1999). The one area where analytical earthwork survey is discussed in positive terms is as part of popular volumes on archaeological field practice (Brown 1987, 44–88; Drewett 1999, 49–50, 59–72), yet the targeted audience of these volumes reinforces the wider perception of the technique as the subjective tool of the local amateur, not the concern of formal, rigorous academic research.

In Matthew Johnson's *Ideas of Landscape* (2006), a brief account of the analytical earthwork survey method is offered as part of a wider critical analysis of the landscape approach in British archaeology. His assessment is primarily negative, questioning its subjectivity, complexity and isolationist stance, the latter because its approach is rarely utilised outside of the UK. That is not to say that elements of this approach have not been utilised more widely, with archaeologists across northern Europe experimenting with comparable mapping techniques, including the juxtaposition of hachure symbols to denote archaeological features and contours to demonstrate the form of the natural topography (e.g. Herrnbrodt 1969). Bowden and McOmish argue that there were groups of practitioners continuing this approach in other parts of northern Europe, with some continuing into the present in Germany (2011, 31), although they would appear to be a minority among their wider archaeological community. It is less common in the American tradition, although rare examples do occur, as with the use of a rough form of the technique to record archaeo-topographical features in field sketches in Egypt's Eastern Desert by Sidebotham and Zitterkopf (1998).

The remarks by Johnson are largely throwaway and have little bearing on the overall aim of his thesis, but this in itself reflects the wider position of analytical earthwork survey as an irrelevant method open to shallow critique like that presented by Johnson, or to simply be dismissed as ineffective (Barker 1993). Johnson's work describes the practice of analytical earthwork survey in disparaging terms, yet his discussion of the specifics of the methodology is openly contradictory; at one stage hachure plans are 'time consuming and difficult for the non-practitioner to interpret', soon afterwards they are 'simple, quick and easy to produce' (Johnson 2006, 95). I would argue that his criticism of the complexity of the hachure style is valid, and there are more effective methods increasingly available with the advent of laser scanning and photogrammetric survey techniques, although Johnson appears to be discussing hachures in direct contrast to contour maps. Continuing this theme, it is notable that where advocates of hachure or contour styles openly debate the positives and negatives, there is a clear selectively in the examples they choose to contrast (for instance Wheatley and Gillings 2002, 109; Bowden and McOmish 2011, 23). The manual on archaeological surveying by Howard (2007) goes some way towards providing a relevant technical explanation on developing an archaeological survey but, by attempting to provide an objective methodology divorced from the interpretive process, fails to engage with many of the important realities of field archaeology, for instance the reasoning behind a survey and the relevance of its results.

Archaeo-topographical survey has therefore seemingly become a peripheral component of archaeological field practice in the UK, as well as arguably at a global level. The failure to develop a mode of application that was both objective *and* effective during the latter half of the twentieth century in line with rationalisation and promotion of scientific practice within archaeological research and fieldwork as a whole led to an incidental side-lining of its use that has persisted to the present. That it has survived at all is largely due to its practitioners being based in national institutions rather than in academic or commercial organisations, although it continues to be taught on a small scale at some universities, and is therefore largely insulated from the changing conditions of field archaeology in the UK. The problem is that within the realms of local authority heritage management and commercial archaeology there is a relatively poor recognition of archaeo-topography, so that when a site with such remains is threatened, there is a lack of skilled practitioners available to record and assess it ahead of development, or to counter it with an informed mitigation strategy.

The experience of analytical earthwork survey

This chapter will now take a slightly different approach by exploring issues relating to archaeo-topographical survey in archaeological research through reference to the work of this author over the last decade. Doctoral research attached to the 'Wallingford *Burh* to Borough' project in particular, a study of medieval urban development focused on a town in Oxfordshire (Christie et al. 2010), sheds some light on the tensions outlined above. An embryonic version of the main project was under way by at least 2002, when small research grants were obtained annually to undertake small-scale survey and investigation. In addition to test-pitting and geophysical survey there was an attempt to begin earthwork survey at two areas around the town. These surveys proved to be relatively ineffective and the original project team correctly identified that with the skills available there would be little value in continuing the campaign of earthwork survey, given the poor research returns. The potential of the area in terms of its archaeological topography when approached by an experienced practitioner was subsequently demonstrated by research from 2008 onwards, which enabled major insights into the layout and development of the *burh* and Wallingford Castle (Figure 5.2). These survey results additionally had the potential to anchor and contextualise other results derived from the Wallingford project, including geophysical survey data. However, its presentation in the final project publication saw it co-opted within an excavation-led narrative that included only a part of its interpretive set, including the dismissal without discussion of a south-eastern bailey enclosure in the castle complex (Christie et al. 2013).

That a more profitable form of integrated survey strategy could be employed is demonstrated by a small research scheme undertaken at the site of a probable Viking fortification at Tempsford in Bedfordshire. Building on a desk-based analysis of documentary material and aerial photographs, a small field grant was obtained to undertake a combined earthwork and magnetometer survey of the eastern half of the site, which was formed by a large D-shaped enclosure backing on to the River Great Ouse (Fradley 2010). The combined results were very effective, supplemented by working both methods in tandem. The earthwork survey had been able to operate in areas of thick overgrowth as well as guiding the geophysical survey grid towards areas of potential that would otherwise have been missed. In turn, the geophysical survey had both supported the results of the earthwork survey and identified clear anomalies in areas where there was no earthwork trace. Conducted over a period of forty-eight hours, this small investigation has helped to realise the potential of this site, and highlights the cost-effectiveness of the approach. It is also of value to highlight that this site was made up of low, denuded earthwork components that would have been unlikely to attract the attention of a technology-driven approach, except perhaps a high-resolution LiDAR survey. Again, there is a reassertion of the value of practical experience of deciphering archaeo-topographical features on the ground and interpretation via the mapping process, skills that are rarely found in the more common framework of ‘ground-truthing’.

Finally, and perhaps most interestingly in terms of the issue of objectivity, research on a pre-Hispanic settlement in southern Brazil, primarily on the area around the small town of Pinhal de Serra in the state of Rio Grande de Sol, has highlighted the value of a subjective approach and the tensions that arise in its critical acceptance within an empirically focused research community (Iriarte et al. 2013). Brazilian archaeology follows an American tradition of creating contour or digital terrain models when undertaking earthwork survey. The results of the analytical earthwork survey carried out as part of this project have been dramatic, raising essential questions about the development of settled landscapes in the region during the second millennium AD. The archaeology of the area, which can be broadly separated as primarily circular ritual enclosures and pit house settlements (Figure 5.3), could be demonstrated to be far more complex than previously realized, as the analytical earthwork survey method could be utilised to actively ask questions about monument form and condition. One of the most interesting cultural contrasts of this project was through North and South American perceptions of the UK survey model. The general perspective was that although it was accepted that survey was making some inroads into understanding these sites, the existence of more subtle earthworks was disputed. It was deemed that the results as they were presented could not be valid because they were based upon visual identification. It was only, as they saw it, when the data was processed digitally, that is the surveyor was separated from the data and an objective mechanism could be established, that legitimacy came into being. Ultimately, despite the rapid interpretive successes of this mapping approach, its subjective basis proved unpalatable to the wider research community.

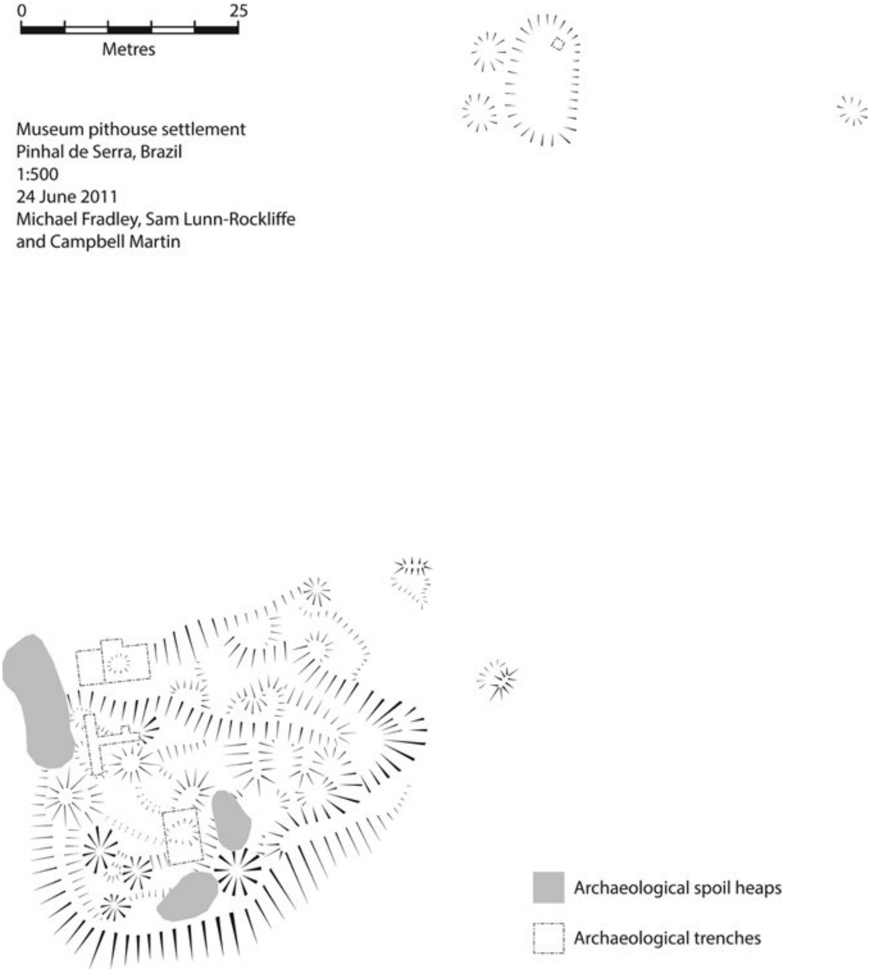

0
25
Metres
Museum pithouse settlement
Pinhal de Serra, Brazil
1:500
24 June 2011
Michael Fradley, Sam Lunn-Rockliffe
and Campbell Martin
Archaeological spoil heaps
Archaeological trenches

Figure 5.3 The use of subjective archaeo-topographical survey techniques outside of the UK is rare. This is an example of a pit-house village from the 'Museum site' in Pinhal de Serra in the state of Rio Grande do Sul (Brazil).

Returning to the broader discussion of archaeo-topographical survey, Johnson (2006, 92–94) borrows the concept of the cold gaze developed in studies of cartography in describing the disengaged, elitist agenda of the patrons and makers of maps. This is a process that archaeological surveyors and other practitioners engage in, including archaeologists such as Matthew Johnson himself (1993, 2010), and serves to create an impossible view which turns the viewer into a 'voyeur-god' (de Certeau 1984, 93; see Aldred and Lucas this volume). The emphasis on the 'distant gaze' of the earthwork plan sidelines the fact that it is simply an accessible, visible representation of the interpretive process of analytical earthwork survey. It is not intended as an unquestionable, objective image. This said, given the small number of practitioners this work can develop an unintentional unassailability amongst the wider archaeological community. Such subjectivity, however, has been acknowledged and celebrated by leading practitioners (Bowden and McOmish 2011, 37). The survey plan/map is the product of a long and careful engagement with a defined area of land, born out of the time a survey team spend creating a survey map, and the emphasis placed on observing and questioning the landforms of their surrounds as light, weather and sound alter how they are perceived (see Poller this volume). The survey model is always accompanied by a textual document providing description and interpretation, although, perhaps unfortunately, not an account of the experiential encounter (a phenomenology, if you will) that can add much insight to the understanding of an archaeological site or landscape; perhaps to highlight it would add to its supposed failings as a scientific, objective method?

Despite common perceptions, earthwork survey as a non-destructive method remains a powerful tool in many research contexts. It is also not a choice of one preferred survey technique over another, and it should come as no surprise that the different methods available are most effectively and economically employed in a synergistic fashion where they are deployed as part of an integrated strategy. It is in these conditions that the methods are able to form something greater than the sum of their parts, and achieve a goal to which the members of any field project would seek to aspire. That integrated survey methods are not regularly employed, and practitioners of earthwork survey are as guilty in this sense as any other, demonstrates a failure among those working in the archaeological sector to exhaust the non-destructive methods available to them or to think imaginatively about the role and relevance of field survey.

The future

Technological advances in survey equipment and methodology are having a rapid and profound impact on how archaeo-topographical features can be recorded and analysed. At a broad level, airborne LiDAR survey is pushing forward the detection of larger features, enabling new understandings of even well-studied landscapes (e.g. Evans and Fletcher 2015). At a more detailed level, laser scanning tools and, more prolifically, photogrammetric survey using imagery captured by unmanned airborne vehicles (UAVs), allow the construction of sophisticated 3D models of archaeo-topograhical complexes.

Recent work at the site of Caus Castle in Shropshire (UK) demonstrates clearly the potential of photogrammetric models created from imagery captured by a UAV-mounted camera to push forward the potential and accessibility of archaeo-topographical survey (Figure 5.4). The site of a medieval castle and associated settlement, potentially set in the enclosure of an earlier Iron Age hillfort, had never previously been subject to a detailed

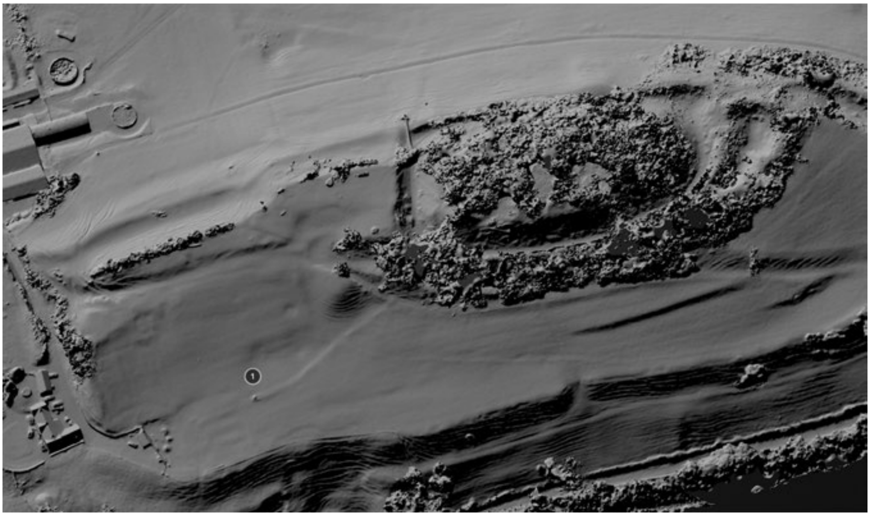


Figure 5.4 A digital 3D model of Caus Castle in Shropshire (UK) built from photogrammetric data collected by a UAV, and recording damage such as soil creep on the earthwork remains (processed by Adam Stanford of Aerial-Cam)

archaeological survey. This survey was undertaken alongside a subjective recording of earthworks on the ground using a differential GPS unit and hand-and-tape survey methods which, among other things, allowed the detailed recording of features in woodland that were inaccessible to the UAV survey. The ability to capture and process large datasets in the space of hours that can replicate, and in some conditions improve upon, the features recorded by traditional analytical earthwork survey methods, is a significant advance on previous efforts to systematically record topography using data recorded on the ground. In this case it allows the clear rendition of post-medieval arable cultivation across part of the site (Figure 5.5), features that were near-invisible on the ground, and add importantly to the narrative of site development.

There is massive potential for the widespread application of digital high-resolution modelling techniques to revive interest in archaeo-topographical complexes in the UK and worldwide. By enabling the forms of objective topographical data collection that were not available to previous fieldwork specialists, such as Philip Barker, and with the equipment required increasingly prevalent, the issues that would have previously discouraged archaeo-topographical survey have been largely overcome. The speed with which data can be collected, and the simplicity with which it can be displayed to a wide audience as an accessible 3D model, are also advantageous factors that should encourage the take-up of these technology-driven methods.

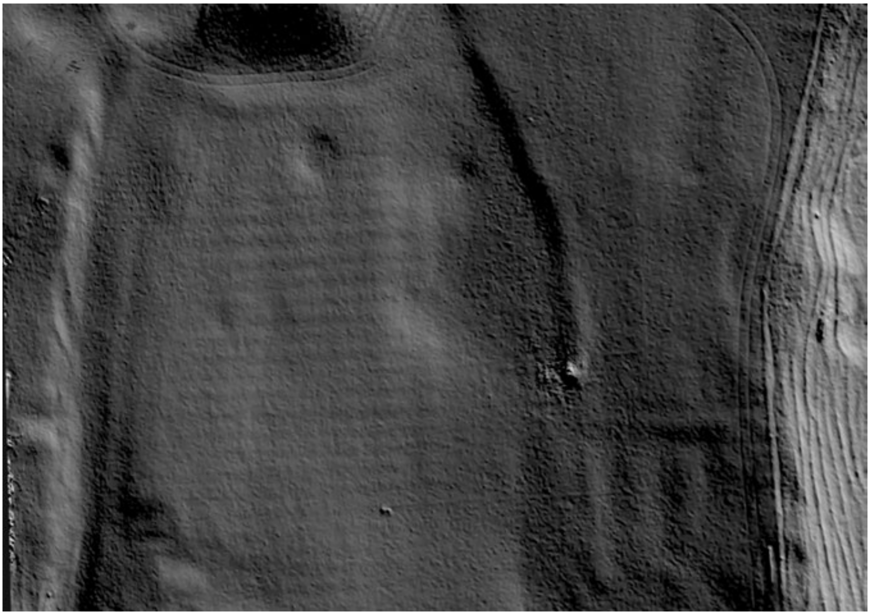


Figure 5.5 A detail from the 3D model of Caus Castle, visualizing the subtle linear post-medieval plough marks across part of the site (processed by Adam Stanford of Aerial-Cam)

If there is a concern, it is that the interpretive rigour that underpinned archaeo-topographical survey in the UK, which is arguably its strongest asset, will be lost in the shift toward laser scanning and photogrammetric techniques (see also Hacıgüzeller, this volume). There is an understandable gravitation towards technophilia in archaeology, but there is a risk that the majority of these new surveys celebrate the simple fact of creating a complex 3D model of a set of archaeo-topographical features, rather than contemplate at length what such a survey is actually telling us about that site. The data is collected for these models as part of a more objective, standardised sampling strategy, although subjectivity remains in the way in which the data is processed and rendered. The surveyor is increasingly divorced from the site as fieldwork becomes more focused on the technical operation of equipment rather than assessment of archaeo-topographical features on the ground. While the creation of 3D models allows the analysis of data off-site, it also presents a very different experience for surveyors, particularly in terms of evolving perspectives of the surveyor/cartographer on the ground and the dialogue of interpretation between fieldworkers involved in a ground survey.

This can be considered further through the example of Caus Castle discussed earlier. On reflection, although the speed of data capture for the resultant 3D model is impressive, would I have been able to utilise it so effectively as part of the interpretation of the site if I had not analysed the archaeo-topographical features so closely on foot? If 3D models are being produced because practitioners can, rather than because of a demonstrable need to or a distinct interpretive outcome, can this be argued to be an improvement in archaeological mapping? There is arguably the need to test the impact and efficacy of different survey models and their integration in blind tests as with the work of Lock and Pouncett (2012), although archaeological fieldwork has a poor track record of attempting to objectively test differing methods alongside each other, even within the process of excavation. It is only through formal assessment of methods, where different archaeo-topographical survey techniques are tested separately on a range of sites, that we will be able to judge the inputs into the mapping of archaeo-topographical features and the research value of the output. It is possible that the loss of interpretive rigour would be negligible, although generally this does not currently appear to be the case.

Conclusions

The future of earthwork survey is likely to be dictated by technological development. The increasing availability of automated 3D scanning tools will bypass many of the faults identified in the construction of large-scale contour mapping, producing data that can be depicted in visually effective, mimetic ways open to a range of manipulations as part of the visualisation process; mimicking individual perspectives and potentially overcoming the issue of the cold, 'powerful gaze'. This, however, fails to understand how a survey and its interpretation are born of a dense, extensive and experiential engagement with its subject landscape that few other archaeological methods could equal. A practical issue with the use and growing dependence on the use of automated, digital technologies, is that it will create a further degradation of archaeological observation skills. There is a risk that the interpretive skills necessary to draw out the potential of earthwork analysis will be lost as these techniques are used to provide visual models and monitor monument condition rather than decipher and understand. The surveyor's role also focuses on the deployment of technology rather than engaging directly with the archaeological features, which instead are analysed in a desk-based situation. Practitioners need to question why they undertake earthwork survey, and if they fail to recognise the potential in analysing and interpreting this resource as part of a dynamic application of the method, then it will hamstring their research.

One of the most important aspects of the analysis of archaeological earthworks is the identification and interpretation of subtle or amorphous archaeo-topographical complexes. Yet the practiced observational skills necessary to detect such features will not be available, despite the capability of scanning technologies to record these forms of evidence in contrast to earlier contour survey methodologies. The question is how are those subtle complexes to be identified and selected for the object of detailed digital survey, if those human techniques necessary to identify their potential are further degraded by the loss of these skills? There remains a gap in the training and skills necessary to assess and interpret archaeo-topographical features to their greatest potential, in part because this process does not conform to a clearly objective practice. There is a pressing need for archaeological practitioners to come to terms with this subjectivity and begin capitalising on this accessible and effective resource.

This chapter has presented a simplified scenario in which different methods of recording archaeo-topography are considered in isolation. The reality is that these forms of survey generally exist within a wider scheme of different forms of archaeological data collection and analysis. The subjective survey of archaeo-topography has firmly demonstrated that analysis of this type of data can be an incredibly dynamic medium of interpretation, and far more than a backdrop to other methods such as excavation. It is not a case of whether we choose to continue to use such methods or opt for the new wave of technologies that can produce objective 3D models of this data, the practical benefits of the latter are clear and should be embraced. The question is more how do we integrate the rigorous interpretive skills developed in the UK into the thinking behind the application of these new techniques, so that it can achieve more than the woefully inappropriate term 'groundtruthing' would suggest.

There is much to be positive about, particularly in the ways in which technological developments are changing and simplifying the ways in which archaeolo-topography can be digitally recorded and displayed in an interactive map format. The increasing availability of LiDAR data and the economic range of UAVs open for use by archaeologists will help bypass some of the technical and interpretive complexities of working with the hachured maps of the analytical earthwork survey method. In line with this trend, I would argue that it is not essential to continue to produce hachured maps of archaeo-topography, but that that it is necessary to ensure the interpretive framework, rigorously investigating the form and chronology of archaeo-topography as a means of creating challenging interpretations of landscape development, is retained. Moving forward to how this can be achieved is less clear. One positive move would be for the experienced practitioners of analytical earthwork survey to be actively engaged in these new techniques, as highlighted in this chapter by the work at Caus Castle. Can analytical earthwork surveyors develop effective narratives of landscape development without the physical practice of constructing a hachure map? If so, can these skills be passed on to new practitioners without having to use traditional field survey techniques as a means of training, or should these techniques always by passed on as part of a solid grounding in survey and low-tech alternatives? There is scope here for open dialogue and debate between practitioners of all forms of archaeo-topographical survey to build a new consensus, not only in terms of what techniques we use, but also what we want to achieve in using them, that draws on the best of the past as we move into an innovative digital future.

Acknowledgements

My thanks to the organisers of the original conference at the University of Leicester for bringing together such a varied and interesting group of practitioners. I am also grateful to members of the relevant survey teams at English Heritage, particularly Mark Bowden, and Steve Roskams of the University of York for their discussions on this subject andAdam Stanford for collecting and processing data at Caus Castle.

References

Barker, P. (1993) *Techniques of Archaeological Excavation*, 3rd Edition. London, Routledge.

Bowden, M. (1999) *Unravelling the Landscape: An Inquisitive Approach to Archaeology*. Stroud, Tempus

Bowden, M. and McOmish, D. (2011) A British Tradition? Mapping the Archaeological Landscape. *Landscapes* 12.2:20–40.

Brown, A. (1987) *Fieldwork for Archaeologists and Local Historians*. London, Batsford.

Carver, M. (2009) *Archaeological Investigations*. London, Routledge.

Christie, N., Creighton, O., Edgeworth, M. and Fradley, M. (2010) 'Have You Found Anything Interesting?' Exploring Late-Saxon and Medieval Urbanism at Wallingford: Sources, Results and Questions. *Oxoniensia* 75:35–48.

Christie, N., Creighton, O., Edgeworth, M. and Hamerow, H. (2013) *Transforming Townscapes: From Burh to Borough: The Archaeology of Wallingford, AD 800–1400*. London, Society for Medieval Archaeology.

Darvill, T. (1996) *Prehistoric Britain from the Air: A Study of Space, Time and Society*. Cambridge, Cambridge University Press.

de Certeau, M. (1984) *The Practice of Everyday Life*. Berkeley, University of California Press.

Drewett, P. L. (1999) *Field Archaeology: An Introduction*. London, University College London Press.

Edgeworth, M. (2003) *Acts of Discovery: An Ethnography of Archaeological Practice*. Oxford, Archaeopress.

Evans, D. and Fletcher, R. (2015) The Landscape of Angkor Wat Redefined. *Antiquity* 89.348:1402–1419.

Everson, P., Taylor, C. C. and Dunn, C. (1991) *Change and Continuity: Rural Settlement in North-East Lincolnshire*. London, HMSO.

Fradley, M. (2009) The Field Archaeology of Charterhouse-on-Mendip. *Britannia* 40:99–122.

Fradley, M. (2010) Tempsford. *Medieval Archaeology Newsletter* 43:18–20.

Higham, R. and Barker, P. (1992) *Timber Castles*. London, Batsford.

Howard, P. (2007) *Archaeological Surveying and Mapping: Recording and Depicting the Landscape*. London, Routledge.

Herrnbrodt, A. (1969) Die frühmittelaterlichen Ringwälle des Rheinlandes. *Chateau Gaillard* 3:67–76.

Iriarte, J., Cope, S., Fradley, M., Lockhart, J. and Gillam, C. (2013) Sacred Landscapes of the Southern Brazilian Highlands: Understanding the Grammar of the Southern Proto-Jê Mound and Enclosure Complexes. *Journal of Anthropological Archaeology* 31.1:74–96.

Iriarte, J., Gillam, C. and Marozzi, O. (2008) Monumental Burials and Memorial Feasting: An Example from the Southern Brazilian Highlands. *Antiquity* 82.318:947–961.

Jamieson, E. (2015) *The Historic Landscape of the Mendip Hills*. Swindon, Historic England.

Johnson, M. (1993) *Housing Culture: Traditional Architecture in an English Landscape*. London, UCL Press.

Johnson, M. (2006) *Ideas of Landscape*. London, Routledge.

Johnson, M. (2010) *English Houses 1300–1800: Vernacular Architecture, Social Life*. Harlow, Longman.

Kennedy, D. and Bewley, R. (2004) *Ancient Jordan from the Air*. London, CBRL.

Lock, G. and Pouncett, J. (2012) Moel-y-Gaer Hillfort, Bodfari, Denbighshire, SJ 0950 7080. *Archaeology in Wales* 51:142–145.

McOmish, D., Field, D. and Brown, G. (2002) *The Field Archaeology of the Salisbury Plain Training Area*. Swindon, English Heritage.

Parcak, S. (2009) *Satellite Remote Sensing for Archaeology*. Abingdon, Routledge.

Roskams, S. (2001) *Excavation*. Cambridge, Cambridge University Press.

Sidebotham, S. E. and Zitterkopf, R. E. (1998) Survey of the Via Hadriana: The 1997 Season. *BIFAO* 98:353–365.

Swallow, R. (2016) Cheshire Castles of the Irish Sea Cultural Zone. *Archaeological Journal* 173.2:288–341.

Taylor, C. C. (1974) *Fieldwork in Medieval Archaeology*. London, Batsford.

Taylor, C. C., Everson, P. and Wilson-North, R. (1990) Bodiam Castle, Sussex. *Medieval Archaeology* 34:155–157.

Wheatley, D. and Gillings, M. (2002) *Spatial Technology and Archaeology: The Archaeological Applications of GIS*. London, Taylor and Francis.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

6 The craft of earthwork survey

Tessa Poller

Earthwork survey in the United Kingdom

In the United Kingdom there is a long and established tradition of recording and analysing upstanding earthworks in the field. This tradition has its origins in 18th-century military surveys and 19th-century map-making (Phillips 1980; Seymour 1980), alongside which archaeological studies developed (Piggott 1965, see Halliday 2016 for a late 19th-century Scottish example). Over time, an increasing codification of archaeological depiction emerged, which had been documented and expressed, for example, in the manuals of the Ordnance Survey (OS) Archaeology Division (e.g. Johnston 1905; Hellard 1906; Bowden and McOmish 2011).

Now, at the beginning of the 21st century, surveys of upstanding archaeological monuments are undertaken for various reasons: as part of commercial contracts or research projects, for instance. Inevitably, different motivations and skills of practitioners will influence which techniques are employed, how resources are applied and how the results are recorded. Despite these differences, a common summative product of field survey is often an interpretive illustration or a map of the key archaeological features observed on the ground. Although superficially illustrations of different monuments may look similar, with the application of standard or archaeologically familiar symbolic conventions, the interpretations may be made through varying levels of engagement with the archaeology itself. Each interpretive illustration reflects a distinct engagement between the archaeologist (or groups of archaeologists) and the archaeology. It is therefore difficult for readers of the archaeological plan, map or drawing to fully understand how the interpretations are made or for them to assess the quality and usefulness for their purpose.

Examining the survey methods employed by national monument recording institutions such as the Ordnance Survey and the Royal Commissions of England, Scotland and Wales (RCHME, RCAHMS, RCAHMW: the former two now called Historic England (via English Heritage) and Historic Environment Scotland, respectively) offers a deeper appreciation of the integral, albeit invisible, relationship between field engagement and interpretation. Field survey has been a mainstay of these national institutions. They have customised particular methods of survey and styles of depiction and, therefore, such details are more accessible, structured, and, in some cases, have provided a standard of practice (Bowden 1999; RCHME 1999; Bowden 2002; Ainsworth et al. 2007; Johnson 2007). The English Heritage guide *With Alidade and Tape* conveniently summarises two essential objectives of earthwork survey: "First, it is intended to produce an accurate scale plan of the site – to record it. Secondly, and at least as important, is to gain understanding of the site – to interpret it" (Bowden 2002, 3). This approach to survey is achieved by an extended engagement with the earthworks in the field, observing slopes and forms, looking for sequences, and aims to produce an analytical understanding and depiction of the earthworks, which is communicated mainly through a scale *hachure* drawing and supporting text descriptions (Figure 6.1). Although these institutions have adopted technological advances in survey equipment in their field recording practice over the years, such as differential Global Positioning Systems (dGPS), these are considered secondary to the use of traditional basic tools, such as pencil and plane table, which are advocated as an unrivalled way to encounter, observe and assess archaeological features (Bowden 2002, 2).

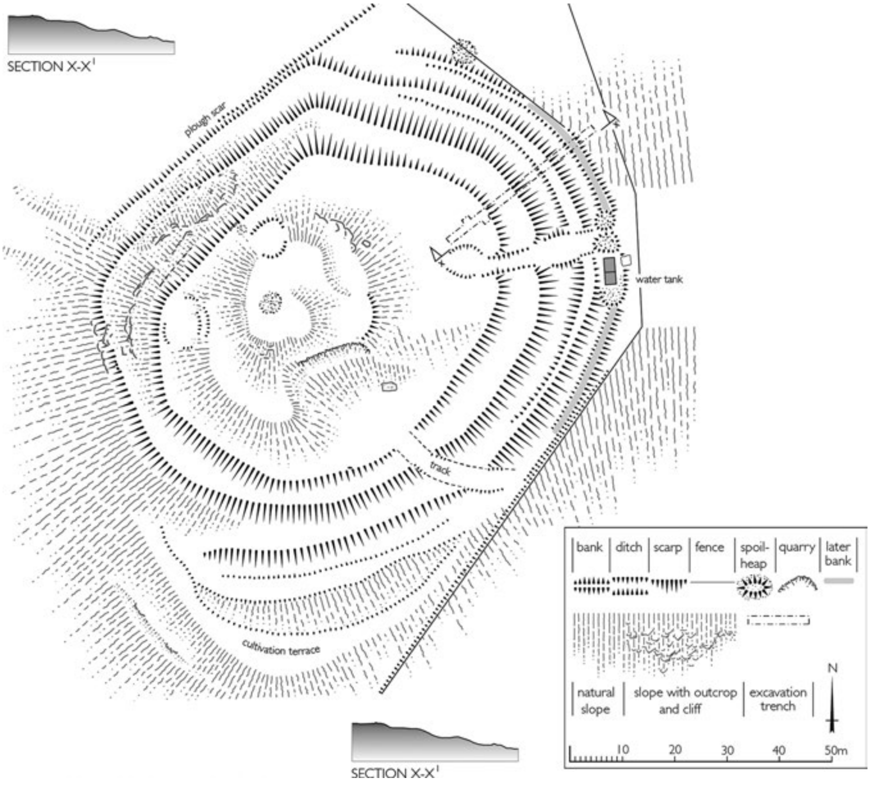

SECTION X-X'
plough scar
water tank
track
cultivation terrace
bank
ditch
scarp
fence
spoil-heap
quarry
later bank
natural slope
slope with outcrop and cliff
excavation trench
N
10
20
30
40
50m
SECTION X-X'

Figure 6.1 An example of an interpretive earthwork survey plan using *hachures* to denote slopes accompanied by a text description, Law of Dumbuils hillfort, Perth and Kinross, Scotland ©Historic Environment Scotland.

In recent decades, concerns have been raised that this longstanding tradition of survey in the UK, one which employs handcraft techniques, is at risk of dying out due to a lack of appreciation of the interpretive relevance of these surveys, something that is argued to distinguish it from other approaches or methods (Bowden 1999; Bowden 2002; Bowden and McOmish 2011; Fradley this volume). With the goal of encouraging more archaeologists, especially those within the commercial and volunteer sectors, to acquire the necessary skills of 'traditional' field survey and keep them alive, a series of books and guides were published on how to survey and depict earthworks by those institutions that still preserved the knowledge (Ainsworth et al. 2007, 3; also see Bowden 1999; Bowden 2002; RCHME 2003; RCAHMS 2011).

From measurement to interpretation

The publications referred to above describe the general strategy for surveying a site, dividing the approach into three parts: reconnaissance; observation and measurement; and depiction (Ainsworth et al. 2007, 6). The approach and techniques are presented as 'tried and tested' over decades of practice and, therefore, as reliable. Comprehensive information is provided both in terms of technical detail and what criteria to consider during each stage of the process, offering a thorough overview on how to structure any survey of an earthwork. Despite the detail expressed in these volumes there is a tension at their core, for very little is written to tell the reader how to develop the crucial skills of observation and interpretation. In the case of determining ambiguous or complex relationships between features, it is proposed that as the investigator gains more 'practice and experience' interpretation will become more confident (Bowden 2002, 7). The specific development of this knowledge is unspoken and assumed to naturally emerge.

Reflecting on personal experiences several surveyors have revealed the importance of the physical act of drawing on the development of skills of observation, often unrecognised for its essential role in interpretation (Johnson 2007, 97; Halliday 2016, 43). Unlike other more-passive methods of data collection, to have to commit to paper what is encountered immediately in the field forces a unique form of personal and peer reflection, which for them is vital for well-thought out interpretations. But how exactly does drawing develop into well-thought out interpretations rather than poor interpretations? There are still questions about the decision-making process behind interpretive drawing that have not been satisfactorily documented.

Revealing the unspoken processes behind interpretation and decision-making is a central tenet of reflexive approaches to archaeology (see Hodder 1997, 1999, 2000; also Andrews et al. 2000; Lucas 2001; Berggren and Hodder 2003; Chadwick 2003; Edgeworth 2003, 2006; Bender et al. 2007; Yarrow 2010). Those who apply these approaches believe interpretations are not simply discovered or emerge from archaeological practice, but instead that they are created. Projects, such as the classic example of Ian Hodder's work at Çatalhöyük, attempted to make the processes of interpretation more transparent and accountable, allowing multiple voices (including those often silent) to be represented (Hodder 2000). While reflexive approaches in archaeology are nothing new, the vast majority have only been applied to the practice of excavation or to the analysis of material culture. With a few exceptions, field survey has been subject to much-less detailed reflection, particularly in relation to interpretation and how its practice is communicated through the resulting products.

Two key elements of earthwork survey that would benefit from further reflection is how knowledge and skill are transferred and how interpretations are produced. Bowden laments that the skill of observing in the field, which he considers to be just as important as the product, is largely unappreciated in the wider discipline and therefore not widely taught to the next generation (Bowden 1999, 21, 25; also see Chadwick 2008, 207). Teaching this method, however, is not as simple as teaching someone how to use a machine. Understanding 'how we see what we see' takes time and effort. This is a central point to Halliday's (2013) reflective article on field survey, in which he discusses the changing nature of his own field observations and interpretations over many years of professional practice, recognising the contingent nature of those processes and their outcomes. It is inferred that through multiple engagements between monuments, people, places and histories, there is a production of tacit knowledge that enables interpretations to be made. The appreciation of this system of knowledge production is preserved only for those in the field, and for anyone outside that tradition it is difficult to understand or to evaluate and, therefore, remains hidden.

Craft and earthwork survey

Earthwork survey, as I have described aspects of it above, lends itself to be considered as a *craft* in the manner defined by Shanks and McGuire (1996). This concept of *craft* shares commonalities with reflexive approaches to archaeology. Shanks and McGuire advocated for a shift in perception of the discipline of archaeology, one which dispensed with conceptual hierarchies and instead enhanced the value of processes that underpin it (Shanks and McGuire (1996). Thinking and doing, therefore, would be treated together.

Influenced by the Arts and Crafts movement of the early twentieth century, Shanks and McGuire distanced themselves from caricatures and clichés which had often defined *craft* as safe, homely and critically unchallenging (Shanks and McGuire 1996, 76). For them, much of archaeology already embodied *craft* and it could be easy to realign a general view of the discipline. A central pillar of this model was to acknowledge archaeological knowledge as a creation through an interaction with and response to materials. Moreover, since archaeological knowledge was *crafted* and not discovered it was therefore essential that archaeologists needed to take greater responsibility for what they did and what they produced (Shanks and McGuire 1996, 85–6). As a *craft* the skills and processes behind archaeological interpretation would be acknowledged; thus opening up the possibility to discuss multiple perspectives equally.

Archaeology as *craft* refers not only to the process of creating outputs, but also importantly to the development of skills through practice. 'Craft suggests modes of activities enacted with an intense awareness, shaped through iterative engagement with materials and making, of the qualities of material. In this, practice is not a compartmentalized mode of activity sealed off from theory' (Olsen et al. 2012, 5). This conceptualisation of practice and the notion of *craft* have a direct relevance to earthwork survey. As outlined earlier, the relationship between the archaeologists and the earthwork (the material) is direct and central to interpretation, thinking and doing are combined in practice.

The general lack of clearly documented reflection in earthwork survey highlights a conflict within the practice itself. For some, field survey, as demonstrated, places high importance on field experience and the practiced eye to inform the illustrative output. While this way of survey has proved its value in documenting and understanding earthwork remains, exemplified by the practice of organisations like English Heritage/Historic England and RCAHMS/HES, there is a question about how well the underlying engagement is appreciated amongst the wider archaeological community and, furthermore, how the outputs, the interpretive drawings or maps, can be understood by the non-specialist. A lack of awareness of the processes embedded within interpretive earthwork survey restrict how far the products can be used and how new developments within survey practice can emerge.

Questions arise, such as how does the *craft* of more 'traditional' field survey remain relevant in the twenty-first century and what are the trajectories for future practice of survey? More specifically, there is a need to consider how field techniques which developed in a non-digital environment during the twentieth century – when the extensive detailed 3D topographic data that has become increasingly available today was unimaginable – can relate to developing data processing techniques and new forms of visualisation (Cowley 2012). The situation demands a more-reflexive examination of how field survey archaeologists work, focussing in particular on the issues of how interpretation 'happens', how such interpretations can be understood by third parties, and the influence field observation has on these processes. To address such issues requires a discussion of how explicit and accessible the processes of field survey and interpretation are in the records that are created. I will return to these questions and issues later, but first I will present a narrative of 'traditional' field engagement with an earthwork. Through this narrative I will demonstrate that *craft* is currently embedded within the practice of survey, but that aspects of this *craft* are not translated in the 'traditional' survey outputs, thus leaving a gap in our appreciation of the production of archaeological images and maps.

Ogle Hill: a narrative of the craft of survey

As part of a research project looking to gain knowledge of the character and chronology of a series of hillforts in Perth and Kinross in central Scotland I had the opportunity to collaborate with investigators from what was then called RCAHMS to undertake several earthwork surveys. Very few of these hillforts had been previously recorded in enough detail to provide a comprehensive understanding of their nuanced morphology or situation in the landscape setting to adequately inform excavation strategies. To create a detailed record was the main goal of the earthwork survey of Ogle Hillfort in 2015. Earlier surveyed depictions of Ogle Hill hillfort were either created for other reasons, such as large-scale mapping (Figure 6.2), or were not metrically accurate despite a more elaborate rendering of the site's morphology (Figure 6.3).

As well as achieving the overall project objectives, the RCAHMS investigation of Ogle Hill provided a convenient occasion to observe the practices of fieldworkers who specialised in earthwork survey and in the production of interpretive drawings. The RCAHMS team I worked with kindly allowed me to observe them through the journey from the field to the final image. As well as attending field visits where I took notes, I also utilised video recordings and time-lapse photography to capture and reflect on the development of interpretation during each phase of the journey. In a latter phase of the survey, a team member was equipped with a GPS to track their movement across the hillfort. The narrative below is an example of the *craft* of field survey, with a particular focus on how observation and dialogue are utilised by the team to progress interpretation. It is important to stress that the practices expressed below are specific to the survey at Ogle Hill and therefore not

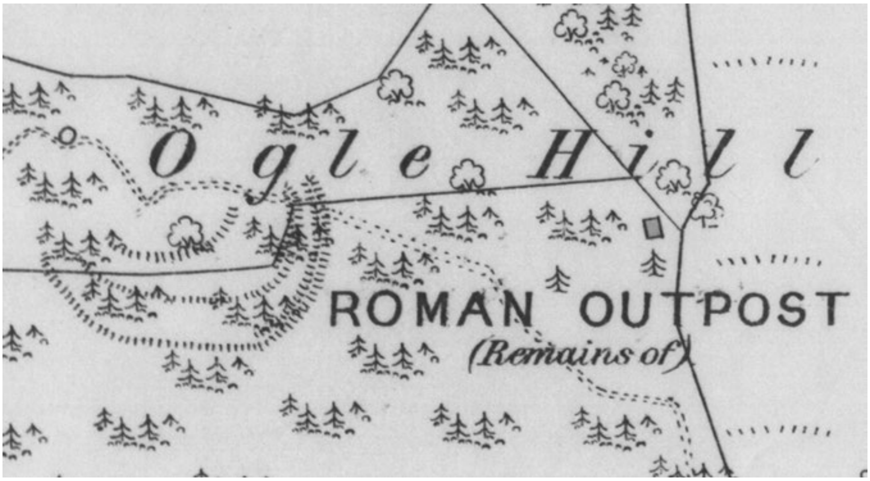


Figure 6.2 This 1865 Ordnance Survey depiction of Ogle Hill, labelled as 'Roman Outpost (remains of)', provides a generalised and limited impression of the site (Ordnance Survey 1865).

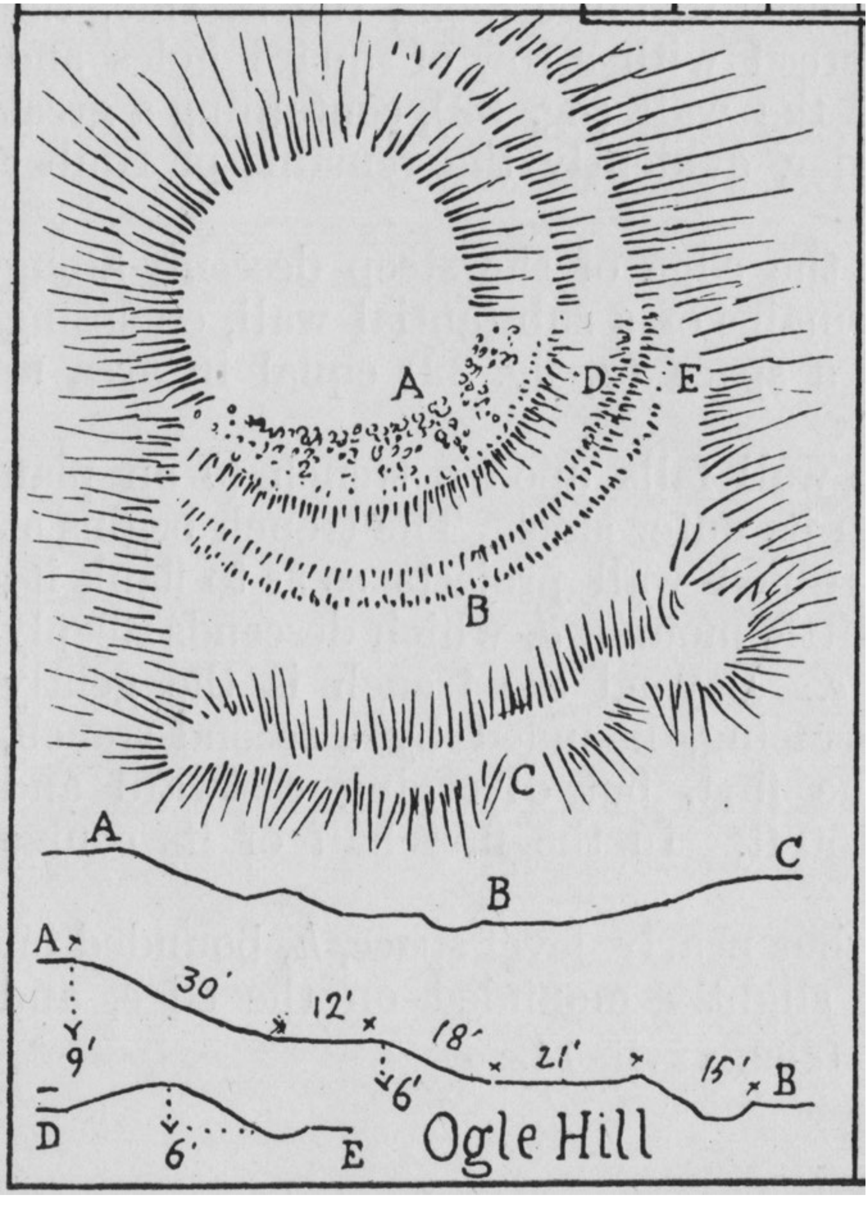


Figure 6.3 An interpretive sketch plan of Ogle Hill by Christison (1900).

universal to all RCAHMS surveys. Furthermore, it is crucial to emphasise that the views and observations presented are from my perspective as an outside participant.

During the Ogle Hill survey, the team generally followed the tripartite approach of reconnaissance, observation and measurement, and depiction, outlined in the guide books mentioned earlier (see Bowden 2002; Ainsworth et al. 2007). Over the course of the survey three different RCAHMS archaeologists provided direct input, but only two were on site at any given time. Each participant, including myself, brought different experiences and knowledge to the survey. Of the RCAHMS team, one had been a field investigator with the organisation for over thirty years, another had been with RCAHMS for eight years and was developing and expanding their knowledge gained from previous employment in the commercial and curatorial sectors, and the third member of the team was newly appointed to RCAHMS as a specialist in survey and illustration with previous experience in both commercial and university research-led archaeology.

Getting to know Ogle Hill

The first two visits to the site were 'reconnaissance' exercises, undertaken early in the year when the sun cast long shadows, and the surface vegetation was at its lowest. The aim of these visits was to get a 'feel' of the place. During this time, the team looked to determine whether it was useful to survey the site at all, whether a measured drawing would provide new knowledge, and, if so, what would be the best scale for depiction in order to communicate this information, while balancing both time and return of effort.

Gaining this 'feel' or understanding of the site was done by looking, walking and discussing experiences of the site together as a team. First impressions of the site followed from climbing up the slope from the vehicle, emerging from woodland, walking to the summit and setting down equipment. Initially, there was a silent appreciation of both the views across the broad valley below and the physical presence of Ogle Hill, which is less than 100 m long and about half as wide. Discussion soon commenced as the team worked their way back across the hill, seeing and describing features that were at once recognisable and could be placed into familiar categories. A collective narrative had begun, each person contributing to a dialogue in which differing views and consensus intermingled (Figure 6.4).

The investigators moved instinctively from archaeological features they were more confident in identifying, the 'known', to the 'unknown', or at least at this stage, to those features not easily classified. From the outset, the two outer banks on the east and south sides of the hill were comfortably identified as archaeologically significant. As they walked westwards the slope of the hill steepened and the banks became less distinct and eventually were untraceable. Disused quarries were noted on the north side of the hill, but to the west, a shallow scarp cutting diagonally across the slope defied straightforward interpretation. Debate ensued, one archaeologist suggested that it might be an entranceway, but the other team member, who felt the morphology was not consistent with other hillfort entrances they had seen, was left unconvinced. Together, the two spent time purposefully walking around the scarp feeling for subtle changes in the topography through their

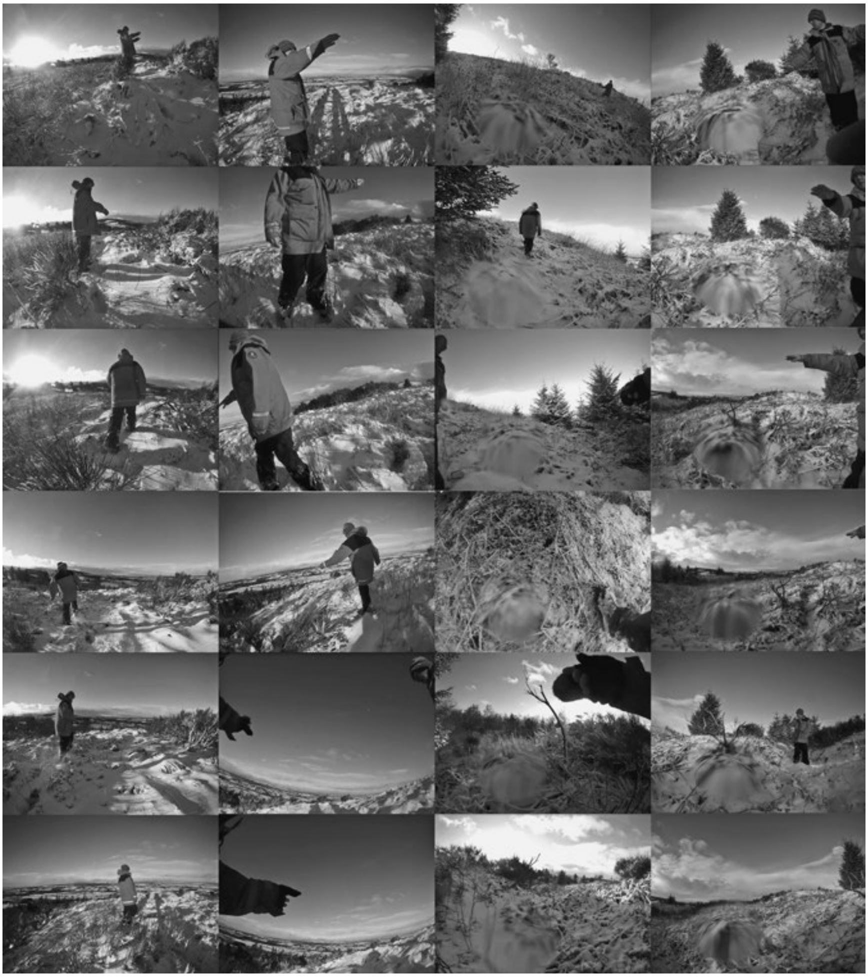


Figure 6.4 Stills from a video documenting the team's interaction with Ogle Hill taken from the perspective of one of the two archaeologists on-site during the first of two reconnaissance visits ©Author.

feet. As their observations developed and became more nuanced they talked over different possibilities, drawing on their previous experiences of other sites for support. No explicit conclusions regarding this feature were made at this stage, and it was highlighted as something to come back to once the whole site had been considered in more detail.

The team continued to observe and physically relate with the monument as they moved across the site 'following' the archaeology. At times the steepness of the slope and, in places, thick vegetation and dense coverage of rotting timber fragments from recent woodland clearance interrupted their paths along an archaeological feature. Nonetheless, they worked their way between elements of the archaeology, joining features and dismissing others. All the while, there was constant discussion punctuated by physical gestures and movements, sometimes as simple as the turn of a head or pointing with the hand, while other movements were more elaborate, involving tracing each other's steps as a means to help understand the other's reasoning through imitation of movement.

These initial site explorations took many hours and were crucial for the archaeologists to conceptually frame the site, linking together features, some of which could only be appreciated once they were traced along the ground. As part of their discussions, the team considered the activities that may have caused the formation of the visible features, both natural and human-made. Already a detailed archaeological story was developing. For example, it was concluded that the banks of the hillfort, which formerly were only recognised on the south slopes, could instead be traced around the full circuit of the hill. Also at this stage, the team thought they may have discovered two previously undocumented excavation trenches, but these required further consideration. Furthermore, the undulations on the summit, visible in between a cover of small shrubs, were thought to most likely reflect underlying bedrock, but the team had yet to completely eliminate the possibility of detecting house platforms. House platforms were recognised on other hillfort sites the team had surveyed and, therefore, in some ways their observations at Ogle Hill were being guided by expectations created by their previous experiences and understanding of 'hillforts' as a site type. Possibilities of chronological relationships were also discussed at this stage of the survey. General notes were taken and initial sketches were made.

Developing an interpretation of Ogle Hill

In the second phase of the survey the interpretation of the site became more solidified through the production of an interpretive drawing. Considering the types of features they had encountered, the team agreed to use a 1:500 scale, commonly used by RCAHMS to depict other large earthworks. At this scale, the main elements such as the bank and ditches would be represented in enough detail to highlight their shape without consuming too much time. Moreover, at this scale the drawing could be easily reduced and reproduced on a printed page. Once the scale was determined this directly influenced what detail would be depicted.

Before pencil was put to paper, a differential Global Positioning System (dGPS) survey was undertaken by one of the archaeologists to mark out the key features, as well as to set out a series of control points to be used during the pencil drawing phase of the survey. The dGPS survey provided a skeleton for the final depiction. In this case, the tops and bottoms of the banks and the edges of large quarries were marked. Although the existence and categorisation of these features were agreed by the team, their measurement reflects the individual engagement of the archaeologist controlling the dGPS with the monument. The picture produced relies on the archaeologist deciding where and how often to take measurements to express how they understand the shape of the features on the ground.

After processing the dGPS data in the office, another field visit was made in order to create a more detailed pencil-drawn interpretive plan. This plan was drawn on clean transparent drafting film overlaid on a scaled copy of the dGPS survey. The RCAHMS archaeologist with specialised illustration skills undertook the drawing while the senior staff member oversaw and directed the process. The lines of the dGPS guided what would be included in the final drawing, but were checked and elaborated on. The team worked their way systematically across the site, agreeing a single narrative that enabled the depiction (Figure 6.5). Standard conventions such as hachures were applied to define the shape, character and form of sloping features, conveying a very specific interpretation, one which had emerged from a process of dialogue and engagement (Figure 6.6). Measurements were verified against control points and some features that had not been recorded by dGPS were surveyed separately with a plane table and alidade, to be added later to the final drawing.

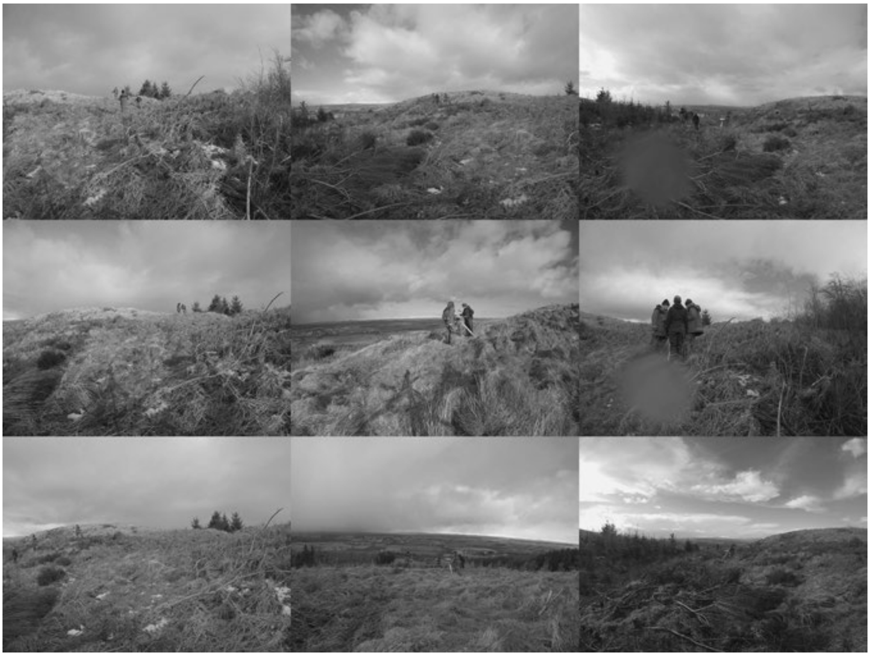


Figure 6.5 A selected series of images from time-lapse photographs showing the team moving around the site as they drew the detailed interpretive plan ©Author.

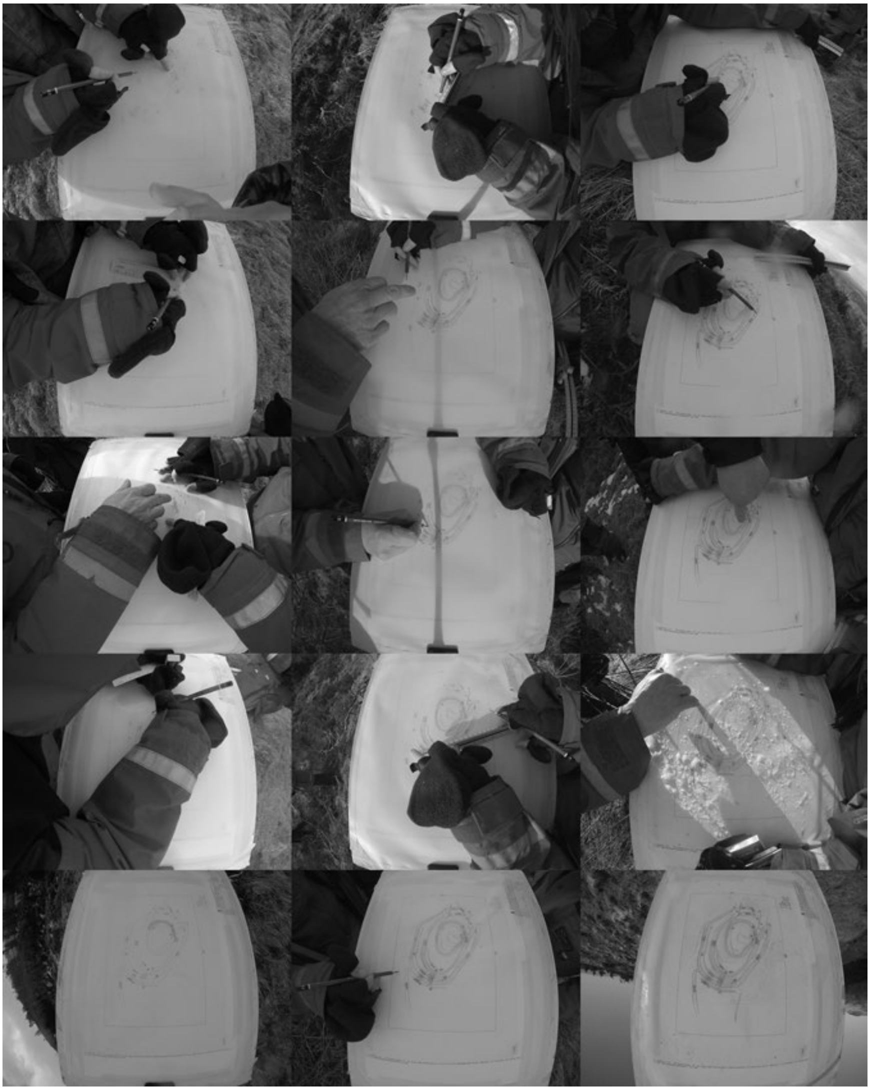


Figure 6.6 Selected images from time-lapse photographs showing the progress of the detailed pencil drawn interpretive plan of Ogle Hill © Author.

It was during this final process that the understanding of the site came together. Since this approach only allows one narrative to be expressed, debatable features had to be defined and agreed through consensus. Initially difficult-to-define features were revisited and explored further by trampling down vegetation and feeling the edge of a cut through their feet, all the while discussing and eliminating possibilities. At Ogle Hill, one area that required further attention was the possible entrance on the west side of the hill. After deliberation and argument, it was agreed that it was more likely a result of quarrying rather than an entrance and the final drawing was made to reflect this decision. If disputes in interpretation continued, the senior staff member tended to make the final call. Thus, while the drawing was a collaborative effort, the authority and input of team members was not equal, each individual influenced different aspects of the overall site interpretation.

A new understanding of Ogle Hill

After the fieldwork was completed, the drawing was scanned and digitised as part of a final stage to produce a publication ready output (Figure 6.7). The digitisation process refined the hand-drawn lines, which became more uniform and consistent. Symbols were also polished and a light colour tone was added that enhanced distinctions between natural and artificial features. The digital lines respected the ones created in the field so this new version directly represented the interpretive information that had been documented on Ogle Hill (Figure 6.8). Although a text description was written to supplement the

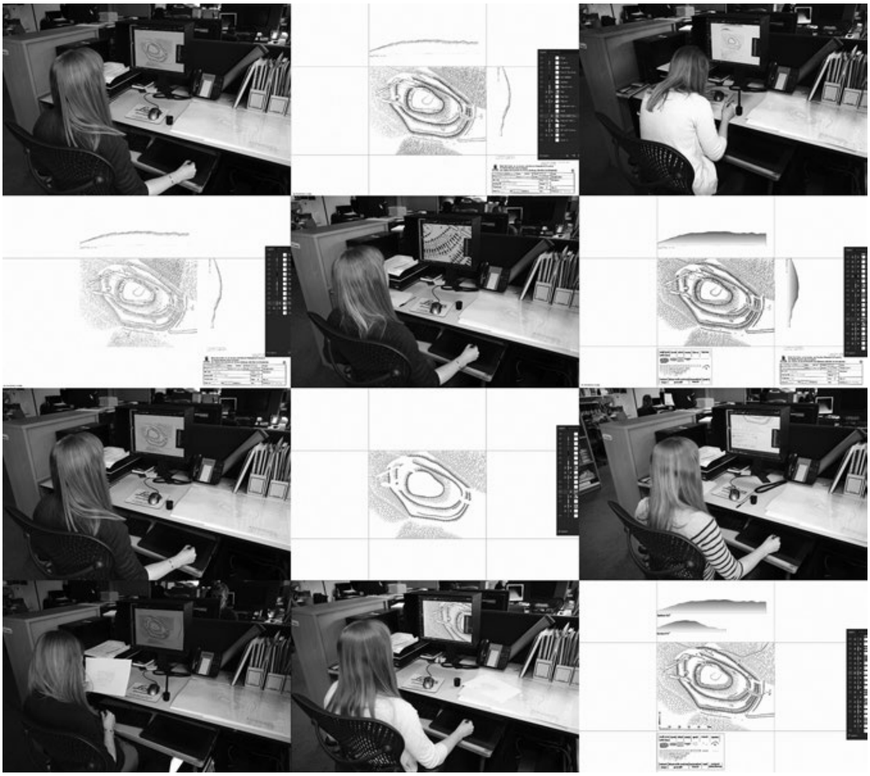


Figure 6.7 A selected series of images from time-lapse photographs documenting the digitisation of the field drawing ©Author.

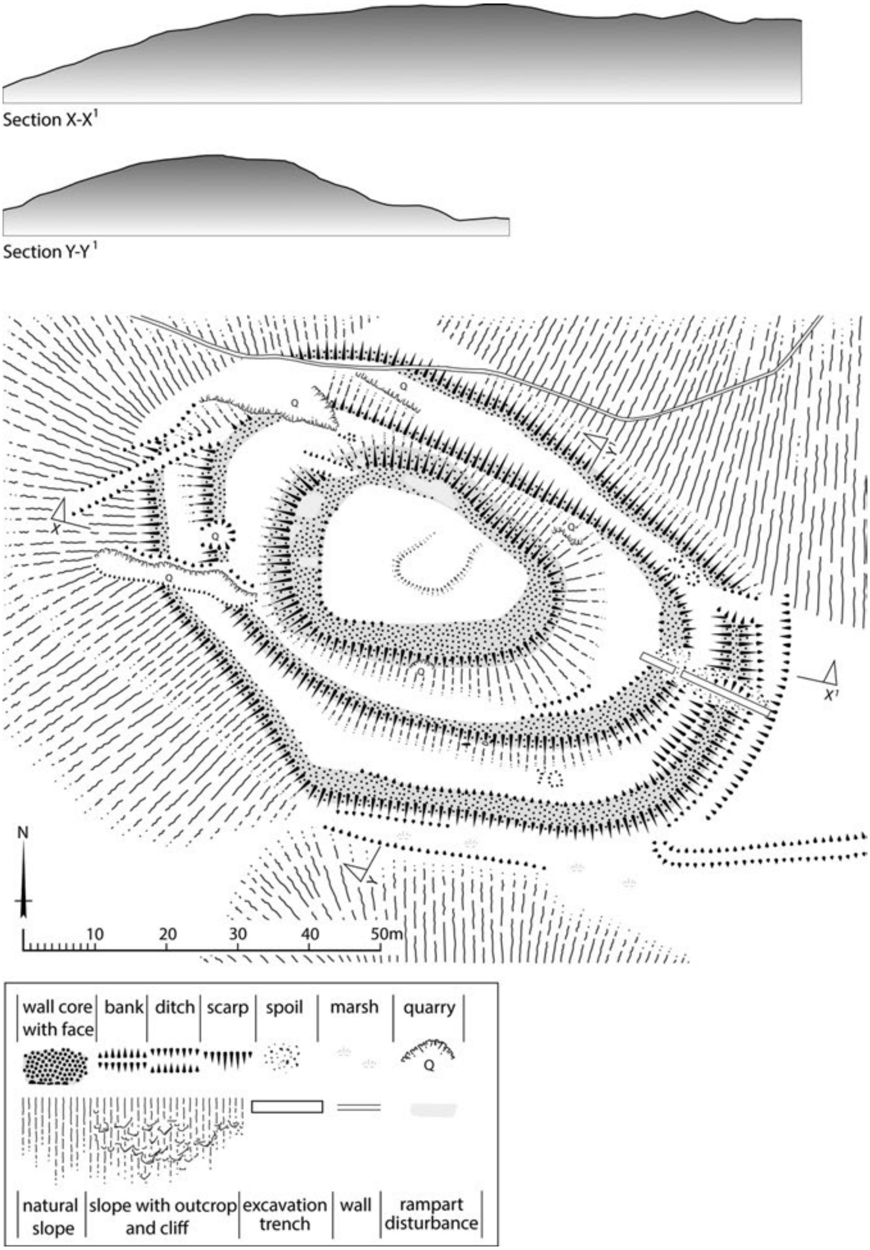

Section X-X1
Section Y-Y1
Q
X
X'
Y
Y'
N
10
20
30
40
50m
wall core with face
bank
ditch
scarp
spoil
marsh
quarry
Q
natural slope
slope with outcrop and cliff
excavation trench
wall
rampart disturbance

Figure 6.8 The final publication ready interpretive plan of Ogle Hill © Historic Environment Scotland.

interpretive plan, it is the illustration that stands as a testament to the process of archaeological understanding.

Taking time on site and engaging with the monument during this analytical survey generated a more-detailed interpretation of Ogle Hill than had been available previously. This survey provided new detail about the character and form of the banks that defined the hillfort. The close proximity between the inner and middle bank suggested to the archaeologists that there may have been several phases to the hillfort's construction, while the impact of quarrying, excavation and trackways on the remains of the hillfort were now more clearly recorded.

By taking part myself I gained a richer understanding and confidence in the interpretation as represented by the lines of the final drawing. I witnessed how decisions were made, was aware of arguments for and against different possibilities of interpretation, and knew which features were more difficult to categorise than others. The final plan is detailed and comprehensive and reflects careful observation and well-considered interpretation, but the underlying reasoning is invisible to any third party user who only has the plan and site description to read. More generally, in cartography the processes involved in the creation of maps are often not translated adequately into the maps themselves (Brown and Laurier 2005; Kitchin et al. 2013). Without being better informed about the processes behind the creation of an illustration or map, it is not easy for any user to fully appreciate or compare the quality and reliability of interpretation of survey products.

The power and responsibility of the map

The interpretive plan of Ogle Hill is now available online through the National Monument Record of Scotland and therefore has the potential to be situated in various contexts and in different assemblages of materials, enabling new archaeological theories and ideas to emerge (Lucas 2012, 237–238; see Olsen et al. 2012, Chapters 4 and 5). The plan is an artefact; a product of "dislocation and disentanglement on one hand but, on the other, one of relocation and re-entanglement with similar or related objects from other sites" (Olsen et al. 2012, 67). This view recognises that archaeological images, and more specifically maps, are things with their own histories and contain the potential power to create new knowledge (Kitchin et al. 2013). Maps and images, in general, are often uncritically treated as convenient substitutes for the entities they depict, becoming the main focus of analysis and research rather than the entities they represent. At this point the framework within which the image or map was originally created may no longer be apparent and therefore their full meaning as a translation is often underappreciated (Perry 2009; Balm 2016, 3–13).

So how can the specific theoretical and methodological framework in which a map was created, such as the surveyed depiction of Ogle Hill, be understood? We can develop skills to read the symbols drawn by the archaeologists which would enable the reader to identify certain tensions or contradictions in the depictive output, and to allow them to differentiate 'good' (consistent) information from the 'not-so-good', but there will still be a gap in our understanding of how these images relate to what was physically encountered by the surveyor in the field or their skill to translate these experiences. To enter that realm and seek an understanding of the processes that produced an interpretive earthwork plan requires at least a site visit, with a copy of the survey in hand, as well as the skill to observe archaeological features. This is both impractical and labour intensive. Furthermore, visiting the site does not necessarily guarantee understanding of the interpretation, as the original processes would have been performed under different conditions. This gap highlights a lack of accountability in the survey output, which is compounded by the aesthetic appeal of a hachured earthwork plan and an unquestioned scientific authority carried by the object itself.

It should be clear from the narrative account of the Ogle Hill survey that depiction, or any type of mapping, relies on the choices made in the field, defining what is worthy to draw and what is not. This is entirely contrary to the statement that "recording and description of a monument are quite separate from interpretation; that the former are intended as an accurate statement of the current form of the archaeological structures, while the latter may change" (Howard 2007, 7). Here, Howard makes a false distinction between recording and interpretation; as soon as one makes a choice of where to take a point or draw a line, in archaeology or cartography, one is interpreting (Pickles 2004, 3). Howard's understanding of interpretation equates to classification, which in his experience can be wrong or misleading, but the problem lies not with the interpretation itself but with the view that sees interpretation as singular, unambiguous and certain (Thomas 2004; Gero 2007).

Currently, the limitations of traditional drawing conventions and approaches to documentation do not allow for ambiguity of categorisation or multiple interpretations to be mapped during an earthwork survey. In some cases, as in the example of Ogle Hill, single narrative depiction does not cause significant issues for the archaeologists involved, and consensus is easily achieved. In other cases, where professionals have debated and have reasoned multiple possible interpretations, this single narrative approach can restrict the way others engage with the evidence, and could easily misrepresent the way in which the archaeological remains can be understood.

Archaeological maps and drawings carry with them an implication of being definitive and authoritative by employing familiar drawing conventions and utilising solid lines to depict the edges of archaeological features. Through their superficial aesthetics, it can be easily assumed that they are all produced by similar methods and to the same rigorous standard. On an interpretive earthwork plan, features that archaeologists struggled with in the field can look identical to those that were identified relatively effortlessly. In the same vein, features that have been observed with great care and appreciation may look the same as those which have not been observed with the same level of skill or were poorly considered. To a degree these concerns reflect a wider issue of how survey processes can be understood, and thus how those processes might be developed in the future.

Readers of earthwork interpretive plans currently do not have the tools to engage with the interpretive process behind their creation and therefore to appreciate their value. Even visiting the site may not help the user if they do not have the expertise or can easily access the original interpretation. Returning to the concept of *craft* may be helpful both in considering how aspects of observation and interpretation are perceived, but also in speculating how those intangible skills may translate into new contexts, such as those offered by developments in digital technologies.

Adapting the craft of earthwork survey

By accepting that earthwork survey is a craft, one can see that the knowledge that is created comes from a reciprocal interaction between the surveyor and the material. Skills of observing and interpreting in earthwork survey are finely developed through the craft, much of which is non-verbal and embedded in doing and in thinking through doing. As Halliday summarises, "survey is implicitly a process of interpretation, best learnt on the ground with the surveying staff in your hands and the archaeology at your feet" (Halliday 2016, 43). Ingold's concept of 'wayfaring', which expresses mobile, inhabited experiences of the world along tracks and pathways, connected and unfolding through time can be aptly applied to the earthwork survey process (Ingold 2011, 148; also see Ingold 2010). Subtle variations in topography are negotiated and internally mapped through haptic experiences both personally and collectively, as archaeologists pass on their knowledge to each other through re-enactments of movement. Such forms of tacit and embodied learning are vital to any craft process:

> Novices learn through repetitive practice in which they are required to copy exemplars shown to them. This is not, however, like running off identical copies from a template. It is not an iteration. To copy from a master means aligning observation of the master's performance with action in the world that is itself suspended on movement. And this alignment calls for a good measure of creative improvisation. There is creativity, therefore, even (and perhaps especially) in the maintenance of an established tradition.
>
> (Ingold 2011, 179)

The survey at Ogle Hill was *crafted*, generated through the collective interaction with and through the monument. As the archaeologists walked and engaged with the evidence at their feet they also engaged their creative thinking by projecting ideas and eliminating elements from their consciousness.

Every offering was rational and reasoned, while also triggering internal imaginings in accordance with their experiences.

Through the craft of earthwork survey the knowledge of interpretation and observation is created. This knowledge is passed on to the next generation, but has the potential to be transformed, depending on the flexibility of the method and level of self-reflection. Each person contributes to the craft and their experiences become incorporated into their interpretation of the tradition. Though it may appear contradictory, what is important for the sustainability and growth of a craft is its ability to adapt and to incorporate new innovations. To this end, when it has been suggested that traditional earthwork survey may be dying out, rather than blindly adhering to the same method in order to keep it alive, perhaps greater self-reflection and flexibility to improvise are needed.

The current approach in archaeology places too much importance on consistency of depiction and standardisation of style in archaeological mapping therefore restricting what can be creatively adapted and the types of knowledge that can be transmitted. Although referring specifically to excavation plans, Richard Bradley's frustration over the lack of awareness of the impact of individual consciousness on the continued production of illustrations is applicable to all forms of archaeological mapping (Bradley 1997, 71). Bradley demonstrated that the dominant styles of illustration, developed by only a few, were often uncritically copied and maintained, and have had a substantial impact on how new generations learn to 'expect' what to see when they get into the field (Bradley 1997, 68). Critical appreciation of the process of depiction which would allow for improvisation and adaptation is not often taught in archaeology. Awareness is therefore key for the future development of archaeological mapping.

Future possibilities of the craft of earthwork survey

Reflecting on the creative products of earthwork survey, particularly the interpretive plan, these currently do not fully exemplify or account for the craft that is performed in the field. The interpretive plan does not express the dynamic engagement through which it was created. Following is a visual representation of a GPS trail, the path, of one the archaeologists during the final visit on Ogle Hill (Figure 6.9). The aim here is to highlight the potential for contextual information to supplement the final interpretive plan. The image of the GPS trail is knowingly simplistic and does not fully communicate the complex level of interaction and experience in the field, nonetheless, it is symbolic of the movement and the transient processes of observation behind the survey. Mapping and recording movement during the survey process could be developed in many ways and linked to the unfolding narrative of the archaeologists' practice, providing the reader with more 'behind the scenes' awareness of the creation of the interpretation. Revealing aspects of the process such as this may enable a deeper appreciation of the

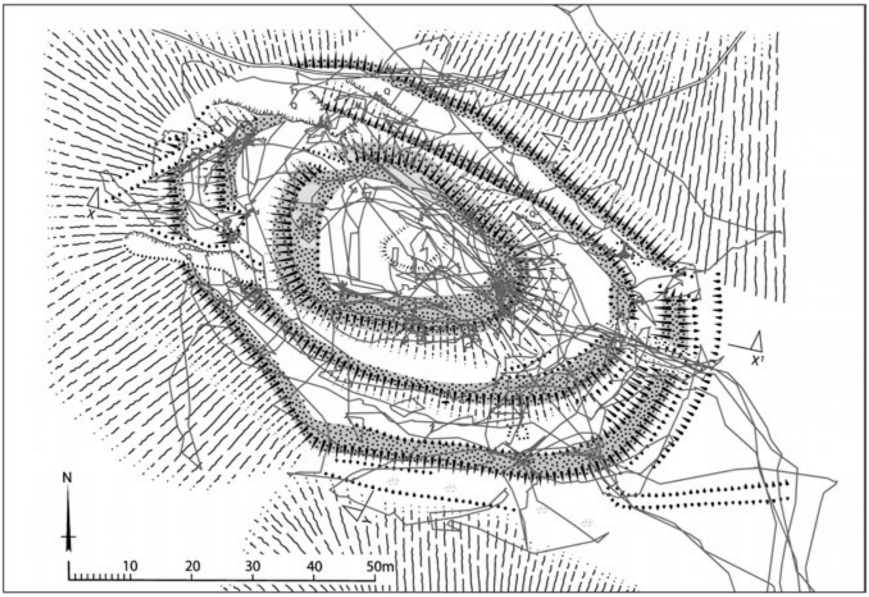


Figure 6.9 Plan of Ogle Hill (© Historic Environment Scotland) with GPS trail showing the coverage and extent of movement of an investigator during the last field visit ©Author.

craft that underpins it; like seeing the tool marks on a handcrafted object. Understanding how the object was made can allow users to assess the quality and appreciate its value.

Returning to the question posed at the beginning of this chapter, I have demonstrated that the experiences and engagements of an earthwork survey are not often fully accounted for in the outputs, such as the interpretive plan. This lack of accountability is not exclusive to earthwork survey. Issues of accountability, accessibility and responsibility are pertinent to all forms of archaeological mapping. There is often a disconnection between those who use archaeological maps and images and those who produce them, which stems from a lack of understanding and communication of how interpretation is achieved. The aspiration for the future would be to have greater transparency and openness of the processes of interpretation so that a variety of audiences may be more aware of the effort and skill that goes into creating archaeological maps, and also so that the archaeological producers are held more accountable to the quality of their outputs.

To realise the ambition of greater accountability will require flexibility, experimentation and exploration, preserving the essence of the craft while challenging the standardised system that has constrained its development. One avenue of experimentation may be through the incorporation of different media to record and disseminate survey results. In the case of Ogle Hill, basic digital video recording and time-lapse photography enabled me to view the archaeologists' practice away from the field. As a supplementary source to the earthwork survey plan, it allowed me to appreciate their engagement and reasoning from another perspective. This is one simple example and using such media has its own issues of implementation and accessibility, but, nonetheless, the goal here is to encourage exploration of the capabilities of different media to understand and open up the mysteries of the craft to a wide audience.

Ever-increasing digitally derived data and developing technologies to record and document archaeological processes, in particular, may afford new ways to challenge current archaeological perceptions and to inspire creative contributions to archaeological knowledge (see Perry 2009; Watterson 2015). According to Morgan and Eve (2012), digital approaches can promote inclusivity, openness and contextualisation in archaeology. Exploiting digital platforms for archaeological outputs may encourage greater interactivity between the user and the products. For instance, elements within images and maps could be manipulated digitally in many ways; features could be isolated and linked directly to other sources of information, including videos, photos or commentaries by specialists. In the case of interpretive earthwork plans, areas of uncertainty and ambiguity can be highlighted or multiple interpretations layered on top of one another. Digital platforms offer the potential to integrate complementary sources more easily and, therefore, perhaps provide insight behind the complex and tacit interpretation processes for third party users. For the archaeologists themselves there are opportunities here to reflect on their practice in different ways, to provide space for creative responses, and to critically evaluate how and why we do what we do.

The future of accountable earthwork survey requires a balance between an appreciation of both the value of traditional approaches and the greater creative development and experimentation offered by new technologies. It is important to maintain the traditional *craft* of observation and interpretation through engaged experience as exemplified by earthwork survey, but can this only be done through the production of the interpretive hachure plan (a static 'bird's eye' view)? An exploration of how alternative or complementary visualisations and modes of expression (ones which uphold metric accuracy) can also be incorporated into the approach should be undertaken. For instance, how can 3D models of monuments, which are increasingly produced in archaeology, be used in conjunction with hand-drawn 2D surveys? Moreover, how do computer-centred methods, such as detailed surface models generated through laser-scanning and automated detection of archaeological features, challenge the human embodied experience and engagement underpinning the traditional survey approach (Cowley 2012; Opitz and Cowley 2013; Cowley and Opitz 2017)? Can these approaches be integrated to enhance the craft of survey? Whether using a 3D scanner, LiDAR imagery, or a plane table to survey a monument, greater reflection on the processes behind interpretive outputs is required to fully appreciate what each method can provide.

Archaeological images and maps will continue to play a vital role in the communication of archaeological practice and experience, more specifically, in the survey of earthworks in the field. Users have the right to demand more information about how maps are created, so they can assess their quality. The future challenge will be to explore the possibilities of visualising the practice of survey; how we use maps and images to enable us to develop our interpretations of archaeology and also how to express this to others. Now is an exciting time to do this. This process will not be straightforward or simple, nonetheless, there is a need to open the door for, and experiment with, more creative engagements to enable the *craft* of earthwork survey to flourish in the future.

Acknowledgements

The author would like to thank the editors of this volume for inviting me to contribute. I am very grateful to the team of HES archaeologists who kindly allowed me to observe their survey methods George Geddes, Alison McCaig and John Sherriff. Thanks also to Dave Cowley, who encouraged and supported various iterations of this article, and to Adrian Chadwick, Heather James and Stratford Halliday, who also helpfully commented on drafts of this work.

References

Ainsworth, S., Bowden, M., McOmish, D. & Pearson, T. (on behalf of English Heritage). (2007). *Understanding the Archaeology of Landscapes: A Guide to Good Recording Practice*. Swindon: English Heritage Publications.

Andrews, G., Barrett, J. & Lewis, J.S.C. (2000). Interpretation Not Record: The Practice of Archaeology, *Antiquity*, 74, pp. 525–530.

Balm, R. (2016). *Archaeology's Visual Culture: Digging and Desire*. London: Routledge.

Bender, B., Hamilton, S. & Tilley, C. (2007). *Stone Worlds: Narrative and Reflexivity in Landscape Archaeology*. Walnut Creek: Left Coast Press.

Berggren, A. & Hodder, I. (2003). Practice, Method, and Some Problems of Field Archaeology, *American Antiquity*, 68 (3), pp. 421–434.

Bowden, M. (1999). *Unravelling the Landscape: An Inquistive Approach to Archaeology*. Stroud: Tempus.

Bowden, M. (on behalf of English Heritage). (2002). *With Alidade and Tape: Graphical and Plane Table Survey of Archaeological Earthworks*. Swindon: English Heritage Publications.

Bowden, M. & McOmish, D. (2011). A British Tradition? Mapping the Archaeological Landscape, *Landscapes*, 12 (2), pp. 20–40.

Bradley, R. (1997). 'To see is to have seen' craft traditions in British field archaeology. In Molyneaux, B.L. (Ed.). *The Cultural Life of Images: Visual Representation in Archaeology*. London: Routledge, pp. 62–72.

Brown, B. and Laurier, E. (2005). Maps and Journeys: An Ethno-Methodological Investigation, *Cartographica: The International Journal for Geographic Information and Geovisualization*, 40 (3), pp. 17–33.

Chadwick, A. (2003). Post-Processualism, Professionalization and Archaeological Methodologies: Towards Reflective and Radical Practice, *Archaeological Dialogues*, 10 (1), pp. 97–117.

Chadwick, A. (2008). Fields for discourse? Towards more self-critical, theoretical and interpretive approaches to the archaeology of field systems and land allotment. In Chadwick, A. (Ed.). *Recent Approaches to the Archaeology of Land Allotment*, BAR International Series (1875). Oxford: Archaeopress, pp. 205–237.

Christison, D. (1900). The Forts, Camps, and Other Field-Works of Perth, Forfar and Kincardine, *Proceedings of the Society of Antiquaries of Scotland*, 34 (1899–1900), pp. 43–120.

Cowley, D. (2012). In with the new, out with the old? Digital workflows and auto-extraction in remote sensing archaeology. In Bostater, C.R., Mertikas, S.P., Neyt, X., Nichol, C., Cowley, D. & Bruyant, J.B. (Eds.). *Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2012, Proceedings of SPIE 8532*. Edinburgh: SPIE.

Cowley, D. & Opitz, R. (2017). Topografia archeologiczna: dane 3D, obserwacja, wizualizacja i interpretacja. In Gojda, M. & Kobyliński, Z. (Eds.). *LiDAR lotnyczy i archeologia*. Zielona Góra: Warszawa.

Edgeworth, M. (2003). *Acts of Discovery: An Ethnography of Archaeological Practice*. Oxford: Archaeopress.

Edgeworth, M. (Ed.). (2006). *Ethnographies of Archaeological Practice: Cultural Encounters, Material Transformations*. Oxford: AltaMira Press.

Gero, J.M. (2007). Honoring Ambiguity/Problematizing Certitude, *Journal of Archaeological Method and Theory*, 14, pp. 311–327.

Halliday, S. (2013). I Walked, I Saw, I Surveyed, but what did I see? . . . and what did I survey? In Cowley, D. & R. Opitz (Eds.). *Interpreting Archaeological Topography: 3D Data, Visualisation and Observation*. Oxford: Oxbow Books, pp. 63–75.

Halliday, S. (2016). Surveys and surveyors in the shadows of our past. In Crellin, R., Fowler, C. & Tipping, R. (Eds.). *Prehistory without Borders: A Prehistoric Archaeology of the Tyne-Forth Region*. Oxford: Oxbow Books, pp. 43–58.

Hellard, R.C. Col. (1906). *Instructions to Draftsmen and Plan Examiners*. Southampton: Ordnance Survey.

Hodder, I. (1997). 'Always Momentary, Fluid and Flexible': Towards a Reflexive Excavation Methodology, *Antiquity*, 71, pp. 691–700.

Hodder, I. (1999). *The Archaeological Process*. Oxford: Blackwell.

Hodder, I. (2000). *Towards Reflexive Method in Archaeology: The Example at Çatalhöyük*. Cambridge: McDonald Institute for Archaeological Research.

Howard, P. (2007). *Archaeological Surveying and Mapping, Recording and Depicting the Landscape*. London: Routledge.

Ingold, T. (2010). Footprints through the Weather-World: Walking, Breathing, Knowing, *Journal of the Royal Anthropological Institute*, 16 (2010), pp. S121–S139.

Ingold, T. (2011). *Being Alive: Essays on Movement, Knowledge and Description*. Abingdon: Routledge.

Johnson, M. (2007). *Ideas of Landscape*. Oxford: Blackwell.

Johnston, D.A. Col. (1905). *Instructions to Field Examiners*. Southamption: Ordnance Survey.

Kitchin, R., Gleeson, J. & Dodge, M. (2013). Unfolding Mapping Practices: A New Epistemology for Cartography, *Transactions of the Institute of British Geographers*, 38 (3), pp. 480–496.

Lucas, G. (2001). *Critical Approaches to Fieldwork: Contemporary and Historical Archaeological Practice*. London: Routledge.

Lucas, G. (2012). *Understanding the Archaeological Record*. Cambridge: Cambridge University Press.

Morgan, C. & Eve, S. (2012). DIY and Digital Archaeology: What Are You Doing to Participate?, *World Archaeology*, 44 (4), pp. 521–537.

Olsen, B., Shanks, M., Webmoor, T. & Witmore, C. (2012). *Archaeology: The Discipline of Things*. Berkley and Los Angeles: University of California Press.

Opitz, R. and Cowley, D. (Eds.). (2013). *Interpreting Archaeological Topography: 3D Data, Visualisation and Observation*. Oxford: Oxbow.

Ordnance Survey. (1865). *Perthshire*, sheet CXVIII.7,1st edition, 25 inch to a mile, map. Southampton: Ordnance Survey Office. ‘

Perry, S. (2009). Fractured Media: Challenging the Dimensions of Archaeology's Typical Visual Modes of Engagement, *Archaeologies: Journal of the World Archaeological Congress*, 5 (3), pp. 389–415.

Phillips, C.W. (1980). *Archaeology in the Ordnance Survey 1791–1965*. London: The Council for British Archaeology.

Pickles, J. (2004). *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. London: Routledge.

Piggott, S. (1965). Archaeological Draughtsmanship: Principles and Practice: Part I: Principles and Retrospect, *Antiquity*, 39 (155), pp. 165–240.

RCAHMS. (2011). *A Practical Guide to Recording Archaeological Sites*. Edinburgh: Royal Commission on the Ancient and Historical Monuments of Scotland, Edinburgh.

RCHME. (1999). *Recording Archaeological Field Monuments: A Descriptive Specification*. Swindon: Royal Commission on Historical Monuments.

RCHME. (2003). *MIDAS: A Manual and Data Standard for Monument Inventories*. Swindon: Royal Commission on Historical Monuments. 3rd Reprint.

Seymour, W.A. (Ed.). (1980). *A History of the Ordnance Survey*. Dawson: Folkestone.

Shanks, M. & McGuire, R. H. (1996). The Craft of Archaeology, *American Antiquity*, 61 (1), pp. 75–88.

Thomas, J. (2004). *Archaeology and Modernity*. London: Routledge.

Watterson, A. (2015). Beyond Digital Dwelling: Re-Thinking Interpretive Visualisation in Archaeology, *Open Archaeology*, 1 (2015), pp. 119–130.

Yarrow, T. (2010). Artefactual Persons: The Relational Capacities of Persons and Things in the Practice of Excavation, *Norwegian Archaeological Review*, 36 (1), pp. 65–73.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Part 3

Experimental mappings and cartographic provocations

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

7 Experimental mapping in archaeology

Process, practice and archaeologies of the moment

Daniel Lee

Introduction

This chapter charts new ideas and practice for experimental mapping in archaeology. The first few sections unpack the histories of 'experimental' and 'mapping' in the discipline and suggest that in some ways archaeologists still think through the Cartesian grid when it comes to maps. It is argued that one of the main reasons archaeologists have failed to experiment with archaeological practice in general, and mapping more specifically, is that the archaeological project is ultimately about interpreting the past. Whilst this endeavour is clearly the main objective for the majority of archaeologists, this chapter argues for experimentation in and of archaeologies of the present; new practice *beyond interpretation,* which in turn might also help us to understand the past.

This approach aligns with the new subfield of 'Contemporary Archaeology'. This is concerned with archaeologies of the contemporary world and has shifted archaeological attention to more familiar materials, interactions and places situated in the present or recent past (Buchli and Lucas 2001a; Graves-Brown et al. 2013a). This concern with the contemporary sharpens the role of the archaeologist who now more explicitly inhabits the world which they study (e.g. writing the present in the present, rather than the past in the present). Part of this shift has been to embrace the role of the archaeologist as participant–observer, active agent, performer and maker of futures. Conceptualising archaeological places and activities as *sites of production* (rather than *sites of reduction* or *reconstruction*) prioritises a different kind of ontology for the discipline in contemporary society. In shifting our full attention from the past, can we find new modes of archaeology for now? This chapter is deliberately provocative, and aims to challenge archaeologists and other disciplinary collaborators to think through material situations, social networks and landscapes in new ways. By challenging some of the notions behind how we create and inhabit the present, perhaps these engagements can, in turn, provide new tools to investigate the past. It is argued that archaeologies of the contemporary world offer the most fertile ground upon which to challenge the usual tropes of the discipline, such as depth and excavation, the search for origins and representation (see Harrison 2011), and realise more fully the potential for experimental practices such as mapping.

With the exception of some Art/Archaeology interactions where new forms of experimental practice are starting to emerge (e.g. Russell and Cochrane 2014), the idea of experimentation in archaeology has strayed little from the field of science and the scientific subfield Experimental Archaeology. In this chapter, key ideas from Experimental Geography are introduced which offer new ways for archaeologists to think about the production of space. The approach adopted here is in response to Rodney Harrison's archaeology-as-surface-survey, which will be discussed later on. Whilst it is not the intention to set up some kind of science/arts opposition, these examples serve to contextualise current method and practice in archaeology, and allow the discussion to explore new ideas. In addition, it is not the aim of this chapter to review all of the experimental and creative engagements in art/archaeology (see Russell and Cochrane 2014; Renfrew 2003). Instead, the discussion will focus upon experimental practice as a means of investigating the very recent past and present (see Gonzalez-Ruibal 2006; Holtorf and Piccini 2009; Graves-Brown et al. 2013b; Harrison and Schofield 2010; Harrison 2016). In other words, starting in the middle (the present) and exploring what this can tell us about the edges (past and future; see Deleuze and Guattari 2004).

Using a series of case studies from recent projects in Orkney, I wish to develop the conversation around different kinds of experimental practice in archaeology, focusing upon mapping. This is achieved by exploring how archaeologists engage with time, space and performance primarily through walking and place-making during archaeological events and collaborations (see Hacigüzeller 2017 for a recent summary on performance in archaeology). I hope to demonstrate the importance of experimental archaeological practice in providing new possibilities, opportunities and trajectories. These can be process-led and engage explicitly with our role as archaeologists in forming new possibilities in the present for the future (see Harrison 2016), and, in turn, the past. It is argued that these 'performative' acts of mapping could form an inherent and explicit part of archaeological practice. An archaeology of the present *demands* new forms of practice and experimentation.

The chapter unfolds with a series of narrative accounts of mapping projects which contain notes from the author, quotes from other participants and collaborative maps. Two case studies from an archaeological residency at a contemporary art festival (Papay Gyro Nights) and a collaborative mapping project (Map Orkney Month) are used to think through some of the main themes. The chapter ends with a series of provocations aimed at getting archaeologists out there, experimenting and mapping.

But first, by way of an introduction, let me take you on a circular walk.

Circular walk

I had never walked around the Peedie Sea[1]*before, and the near-perfect circle of its model boating lake – one of Orkney's largest circular monuments – offered me the chance (Figure 7.1). Like some concrete Hadron Particle Collider, atoms are replaced with kids and dog walkers; at least that's the way it felt walking several times around the circumference. Collisions, thankfully, are rare. The Oyce and Ayre offered the perfect place for the Vikings to haul up and protect their ships. For centuries, the town has been encroaching upon the Peedie Sea. In 1706 the sea was just over 20 m from Broad Street,*

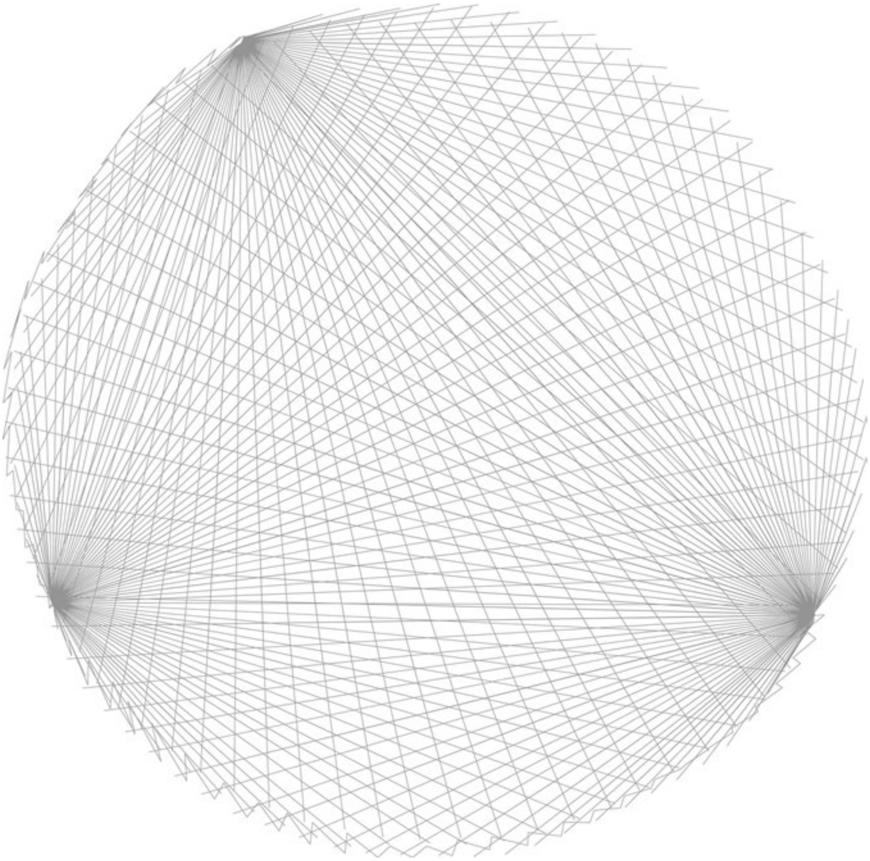


Figure 7.1 Circular walk around the Peedie Sea, Kirkwall, Orkney. Experimental GPS map made through walking. Based on material encounters made with the gound surface, such as the concrete walkway and impressed markings, and land marks in the town – St Magnus Cathedral, Lidls supermarket and Ayre Mills. The lines represent a space-time map made by combining the data from three fixed points and the walker collected at the same time (Map by author).

the main road through Kirkwall town centre. After years of building piers out into the water and reclaiming land, the distance is now around 250 m. The remaining shallow silty loch takes all the surface runoff water from the town. In the autumn of 2006, when the sluice gates malfunctioned following record rainfall and high tides, the Peedie Sea reoccupied the town.

On my first walk, I had to concentrate. I was trying out a new technique and wanted to get it right. When walking around the concrete pathway, I noticed marks in the surface – lines and footprints – but didn't have time to study them in detail. My focus was on keeping a steady pace and referencing key places in the townscape with my GPS drops: St Magnus Cathedral, the Ayre Mills at the mouth of the Oyce and Lidl's Supermarket. My focus was at closer scales and tempos:

Walk in – drop – pick up – drop – pick up – drop – pick up – walk away

On later walks, when I could study the concrete surface at my leisure, I tracked the numerous footprints and marks made in the once-wet surface: shoes, dogs and birds. Buggy and bicycle tracks that start and lead to nowhere (Figure 7.2). Past journeys and movements enshrined in the monument surface. The concrete had been laid in sections, divided by wooden planks that are now nearly rotten. Some sections have clearly been replaced. These journeys may have started innocently enough, but soon ran into trouble when a strip of newly laid concrete was encountered. Perhaps some marks were made deliberately following that deep-seated urge to test how wet the concrete is. Mandy certainly thought so, in 1977 (or so it appears from the faint finger writing), when she wrote 'Who owns this foot, Mandy owns this foot' then pushed her right trainer into the concrete before drawing a rough circle around the whole inscription.

My 'performance', walking the circle, was witnessed by a sandwich-eating couple who watched bemused from their car near the model boating club

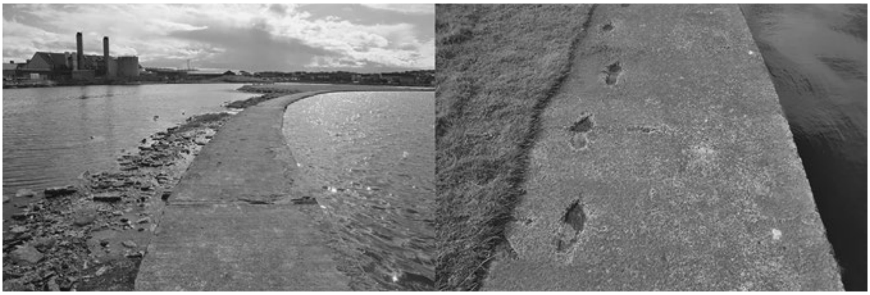


Figure 7.2 Walking around the Peedie Sea, Kirkwall, Orkney. Two views of the circular concrete path around the model boating lake with impressed markings visible in the surface (Photographs by author).

house as I marched around and around. There is now some kind of symmetry between Mandy, the other footprints and my own, each step a mark in time and space, each step a line. The footprints seem to offer up the concrete circle and invite you to walk. The potential for circular movement. This invitation has led me to these histories and stories, and the search for more. Whilst my walks now make reference to the history of Kirkwall as the town slowly encroached upon the sea, this pseudo-Hadron Particle Collider has set up the potential for new encounters, beginnings and acceleration. These are all bound up in movements in space and time, but on different scales.

I wait with anticipation for the next concrete resurfacing to leave my mark.

Maps, mapping and archaeology

Field archaeology has a long history with maps. Born out of antiquarianism and modernity and a need to quantify the landscape in Cartesian grids and triangulations (Bowden 1999:19–21; Thomas 2004: Chapter 7; see also Krauss 1979; Ingold 2000), maps and archaeology are intertwined on a wider scale. Of course, maps have always been political (Wood 2010). From the military beginnings of the Ordnance Survey during the late eighteenth century in the UK (Hewitt 2010), to the popular use of military technology in Global Positioning Systems (GPS), along with performance, direct action and experimental cartography by contemporary artists (Harmon 2009; O'Rourke 2013), maps and map making are contested ground. With the agricultural improvements of the eighteenth and nineteenth centuries came an *authorisation* of the landscape (Withers 2000), where boundaries, place names and archaeological sites (often Anglicised in Scotland and Wales), were inscribed onto large conjoining sheets of parchment for political control. Detailed mapping of the UK was complete by the late nineteenth century, and the national grid was imposed in the early twentieth century, comprising regular grid lines triangulated using a network of several thousand concrete trigonometrical (trig) points (Hewitt 2010). Throughout the twentieth century, this Cartesian method of quantifying the landscape has crept into our psyche. Despite recent critiques offered by the adoption of phenomenology (e.g. Tilley 1994) and the landscape 'turn' of the early 1990s (e.g. Bender 1993; Thomas 1993), Cartesianism remains remarkably pervasive in archaeology.

Accurate surveying methods were quickly adopted in field archaeology as it developed during the twentieth century, particularly following the more-rigorous scientific approaches of the New Archaeology in the 1960s and 1970s. The plane table and alidade soon gave way to the Total Station theodolite and now differential GPS and GNSS (Global Navigation Satellite System). Archaeological sites became miniature countries, mapped out with grids, temporary bench marks and survey stations (Barker 1993:171–180; Bowden 1999:43–70; Roskams 2001:133–152). Archaeologists think in grids, and can move effortlessly between vertical and horizontal planes and different scales in a kind of archaeo-mental map. Of course, archaeological practice is inherently interpretative (see Hodder 1999), and field survey is certainly no different (see Bender et al. 2007). Despite this, I would argue that field training still demands that archaeologists think through sites and landscapes by the grid, the plan and the map.[2] The recent meteoritic rise in 3D modelling techniques (e.g. laser scanning and photogrammetry) and Virtual Reality (see Barceló et al. 2000; Forte et al. 2012; Remondino and Campana 2014) are offering different forms of visualisation which are beginning to erode our obsession with the grid. The grid, however, remains, Figure 7.3.

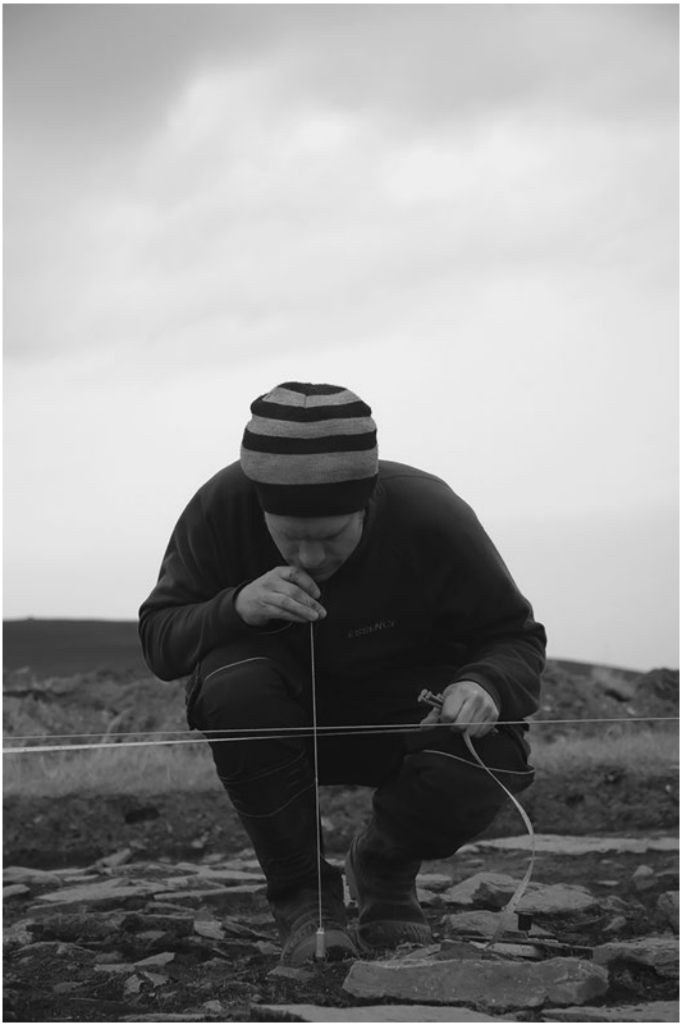


Figure 7.3 Working by the grid; the author setting out a local grid using survey pegs and tapes to draw a scaled plan (Photograph Rebecca Marr).

Archaeological mapping during the twentieth century mirrored that of the Ordnance Survey. Both projects attempted to provide objective representations of structures and surfaces as they appear; both are positivist in their aspirations to provide accuracy and objectivity; both are truisms. They diverge, however, with their relationship (perceived or real) with time (see Lucas 2005). Both, of course, are themselves situated in the present and are themselves artefacts of now. Whereas Ordnance Survey maps deal more strictly with the present as a 'surface layer' (see Harrison 2011) and are only updated as the topography changes, archaeological maps attempt to objectively record surfaces or landscapes of the past as they *appear* in the present. For many archaeologists, they are *representations* of the past.

Hidden within this realist approach to maps and 'archaeological code' is a large dose of subjectivity. As I and others have argued, (archaeological) maps are often highly codified, in their making and subsequent reading, and with this comes both control and authority (Wood 2010; Lee 2016). Archaeological maps and plans have a distinctive visual language (Wickstead 2008). Reading between the lines, subjectivity appears in the style, technique, experience of the mapper and what is left out or drawn in: 'Drawing, like archaeology, is an art of traces' (Wickstead 2013:552). This subjectivity, however, is hidden from view in the archaeological map. In the same way, the mappings and process behind the archaeological map – movement, temporality, experience, the map taskscapes – are obscured in favour of the final product. Archaeologists quite happily remove themselves from the map in favour of clean lines, standardised symbols, accuracy and authority. Is part of the reason archaeologists choose not to draw themselves onto the map, because archaeology is primarily about interpreting the past, rather than the implicit and tangible role of archaeologists in the co-production of the present?[3] As will be argued later, archaeologists need to *step out of the grid*, and experiment with the processes and materials of archaeology and explore new ways of thinking about space, time and movement.

It is important to consider how archaeological maps, and the mappings that produce them, have become de-politicised (particularly in the Western world).[4] This has certainly been a point of discussion in geography and historical geography over the last few decades (Wood 2010). Archaeological maps have been reduced to static, a-political, safe, authorised images or 'tracings' of sites and landscapes. Perhaps archaeologists should 'make a map, not a tracing' (Deleuze and Guattari 2004:13), an important point that will be discussed in more detail next. Can archaeologists utilise their own distinctive archaeo-mental map to create different forms of survey and map? One way to proceed would be to subvert some of the methods and practice archaeologists take for granted, and explore more experimental modes of enquiry. I will return to this point later in the chapter. Before examining experimentation in cultural geography, it will be useful to briefly chart the history of experimentation in archaeology.

Archaeology and experimentation

Along with maps, archaeology has a long history with experimentation. This section aims to briefly explore how experimentation has been employed within the discipline. A distinction is drawn between scientific experiment, particularly within the subfield of Experimental Archaeology, and the contrasting use of experimentation in areas such as Art/Archaeology. Whilst it is not the intention to perpetuate oppositions between science and art, these examples serve to demonstrate where different forms of experimentation have been employed in archaeology, and how this might explain the discipline's engagement with maps outlined above.

Despite being both an arts and humanities subject, archaeology is still principally understood by many as a science-based discipline (Trigger 1991). Of course, the application of science and scientific experiment forms a significant part of archaeological enquiry and there is not the space to discuss this expansive field in detail here (see for example, dating, Aitken 2013; Zooarchaeology, Reitz 2008; Environmental Archaeology, Reitz and Shackley 2012). What is important to the discussion is understanding where and when archaeology has used experimentation in practice. Science-based studies in archaeology came to the fore in the 1960s and 1970s during the New Archaeology's quest for objective rationalism and empiricism (Hodder 1986). Alongside a concern with ethnoarchaeology and the archaeological study of the present (e.g. Rathje 1979; see Harrison 2016:166), experimentation, and the new subfield Experimental Archaeology, became one of the key strategies for Behavioural Archaeology (Reid et al. 1975; Schiffer 1976; Schiffer et al. 1994). Under this paradigm experimentation in archaeology aimed to learn about the past by reconstructing past activities, tasks and processes of technology in the laboratory. Experiments in the present enable archaeologists to make direct comparisons with similar scenarios in the past such as stone tool use, pottery manufacture, animal butchery, food production and storage, site formation processes (Coles 1973, 1979; Reynolds 1999). Experimental Archaeology, and the application of experimentation was, therefore, synonymous with notions of 'reconstruction', 're-enactment', 'reproduction' and 'replication' (Reynolds 1999:159) – many of the 'requirements' for an investigation of the past. Such scientific experimentation in the lab or field has shaped how the notion of experimentation has developed in archaeology; principally, experimentation as a means of objectively learning about the past by experiment in the present.

In contrast to these scientific approaches, a more socially driven archaeology has used experimentation in different ways, making a more explicit link between subjective *experiences* in the present and how interpretations are made about the past. Post-processual and Interpretative Archaeology in the 1980s and 1990s developed new theory and practice which embraced the situated nature of the archaeologist writing the past in the present (Hodder 1986, 1999; Shanks and Tilley 1987). For example, the Leskernick team undertook pioneering experimentation in narrative and reflexivity to explore the later prehistoric structures, settlements and landscape on Bodmin Moor, Cornwall (Bender et al. 1997, 2007). This included multi-vocal approaches to fieldwork, artistic interventions such as wrapping stones to highlight structural features, and recreating house doorways for phenomenological studies. The reflexive accounts of the fieldwork team were brought to the fore in an innovative publication alongside more traditional survey and excavation in order to interpret changes to the prehistoric landscape.

The Leskernick work represents a highly original and experimental landscape project that pushed the boundaries of archaeological practice; they employed experimentation in archaeology in new ways. Given this innovative work, it is perhaps unfair to single out this project, however it is worth exploring recent criticism of this work for the purpose of our discussion, as it forms an exemplar for many Art/Archaeology endeavours. As Doug Bailey (2014:239) points out, the Leskernick team may not have gone far enough to dislocate themselves from standard archaeological fieldwork and modes of prehistoric landscape interpretation, even though their approaches were radical at the time and are still influential today. Bailey (2014:240–241) is correct when he suggests that the limitations of projects such as Leskernick is that however experimental the fieldwork was, they were bound by a requirement to interpret the past and to justify this academically, a point that is important to the discussion here (see also Thomas et al. 2017). He suggests that this paradox traps many archaeologists exploring experimental practice, typically at the boundary of art and archaeology. Whilst Bailey's critique has bite, perhaps the role of experimentation is not as polarised between the past and the present as he suggests. Clearly, experimentation can be both about how we construct and interpret the past *and* the present, however it might be that we can find new ways of using experimentation for exploring different temporalities. Indeed, both the traditional scientific *and* social approaches in archaeology use experimentation in the present to learn about the past. Bailey concludes by advocating a non-explanatory, non-representational and non-temporal approach that does not attempt to reconstruct the past (Bailey 2014:240–241, 248,), drawing on the work of Michael Shanks and his ongoing exploration of archaeology and media (see Shanks 2017; see also Pearson and Shanks 2001). Bailey suggests that 'to argue for a non-representational archaeology is to argue for release; it allows archaeologists to cut free and to let loose' (Bailey 2014:248). For him, experimental archaeologists are those who trancend disciplinary boundaries to disartiulate, repurpose and disrupt their Art/Archaeology practice (Bailey 2014; Bailey 2017a).

As we can see, archaeology is quite used to the idea of experimentation, however the 'safe ground' for experimentation is usually bound up in objectivism, positivist scientific endeavour, traditional fieldwork practice and a need to interpret the past. In contrast, other forms of experimentation in a more socially driven archaeology are emerging, exemplified in recent Art/Archaeology interactions where experimentation and risk taking are the norm (Bailey 2014; Thomas et al. 2017).

The point here is not to criticise the scientific endeavour or the subfield of Experimental Archaeology and unfairly contrast it with recent Art/Archaeology interactions, but to understand how experimentation has been used in archaeology in order to explore new thinking towards experimental archaeological practice. The idea of experimentation is inherently broad, be it through methodology, philosophy, interdisciplinarity or reflexivity. But the underlying aims are more focussed, namely to 'push the limitations of current conventions of representation and knowledge-making' (Last 2012:708). To conclude, 'the experimental' is a powerful tool to investigate both the past and the present. Archaeology must move beyond the idea of experimentation from positivist science, and perhaps even the use of experimentation to investigate the past, and find new ways to experiment with archaeologies of now. Before we set out new ideas for experimental mapping in archaeology, let us consider how geography has employed experimentation to investigate the production of space.

Experimentation in cultural geography

Geography specialises in space (see Tuan 1977). Recent trends in Human Geography, and in particular Cultural Geography, are relevant to the discussion here and challenge us to think about how archaeologists are implicit in the production of space. Along with a landscape turn (Cosgrove 1984; Wylie 2005) and creative turn (Hawkins 2014, 2017), geography has been engaged with a re-evaluation of its relationship with space and the map through Critical Cartography (Crampton and Krygier 2005; Kitchin and Dodge 2007) and Critical GIS (O'Sullivan 2006; Thatcher et al. 2016). These subfields have sought to question where maps and data come from, how and why they are used, and to politicise these processes. This has been coupled with branches of Cultural Geography that have sought to prioritise practice, process and performance (movement) in 'non-representational theory', rather than discourses centred upon representationalism and the *products* of social and material relationships (Thrift 2008). Further to this, Hayden Lorimer suggests that these 'self-evidently more-than-human, more-than-textual, multisensual worlds' are better understood as 'more-than-representational' geographies that are 'multifarous, open encounters in the realm of practice' (Lorimer 2005:83–84). In short, and of significance to our discussion here, these trajectories have led to practice and process-led geographies that embrace the diversity of everyday encounters as they happen.

Amongst this progressive surge from the late-2000s onward, Experimental Geography questioned the notion at the very heart of geographic enquiry – space. Experimental Geography was first coined by artist Trevor Paglen in 2002, and in 2008 he combined with geographer Nato Thompson amongst other collaborators in a seminal book *Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism*, published to support an interdisciplinary exhibition (Thompson 2008a). It contains essays, image/text montages, drawings, installations, sculpture, artist maps, counter-guides and counter-cartography, drawing on a wide range of media, practice and performance and was a bench mark for contemporary art/geography interactions. The notion of experimental was employed to challenge methodological practice, perceptions of space and its production, and explore more explicitly the relationship between geography, art and creativity (see also Hawkins 2014, 2017). As Last (2012:707) points out, the notion of 'experimental' is far from unified in geography and Experimental Geography is perhaps unified only by its diversity. Significantly, experimental geographies are not exclusively undertaken by geographers (e.g. artist Trevor Paglen's work), a democratising trend that is currently being debated in archaeology (see Holtorf 2015). Experimental Geography moves between disciplines, rather than the other way around.

Thompson states that 'Experimental Geography, like it sounds, is more experiment than answer' (Thompson 2008b: 13). He suggests that, 'Experimental Geography should be considered as a new lens to interpret a growing body of culturally inspired work that deals with human interaction with the land' (Thompson 2008b: 13). Following Lefebvre's (1991) analysis of space and Benjamin's (1978) call for a move beyond critique to a politics of lived-experience, Trevor Paglen (2008:29) argues that 'cultural production and the production of space cannot be separated from each another, and that cultural and intellectual production is a spatial practice'. For Paglen,

> the task of experimental geography, then, is to seize the opportunities that present themselves in the spatial practices of culture. To move beyond critical reflection, critique alone, and political 'attitudes,' into the realm of practice. To experiment with creating new spaces, new ways of being.
> (Paglen 2008:32)

Experimental Geography provides us with innovative ways of exploring the production of space in practice and how this space is produced by culture. Geographers' engagement with material culture is fundamentally (but not exclusively) about the present. More recently, experimental geographers are exploring the use of sound (both listening and recording; Gallagher and Prior 2013) and video (Garrett 2011) as research, interpretative and disseminative tools. These methods clearly resonate with the archaeological interest in exploring materials and space from the recent past and present. Indeed, many similar themes have been explored within Contemporary Archaeology in the last two decades, for example in media and film (Piccini 2009, 2015a), performance (Pearson and Shanks 2001; Pearson 2006, 2014; Hacigüzeller 2017), sound (Wilson 2009), media (Piccini 2015b) and innovative mapping (Aldred 2014).[5] Archaeology, and our current interest in exploring innovative mapping, would benefit from exploring these key ideas in Experimental Geography that concern experimental engagements with material culture and the co-production of cultural space.

Experimentation for archaeologies of the present

The discussion so far has considered how we make and use maps in archaeology, and argued that this has bound us to the grid. It was also suggested that the use of experimentation in archaeology is often wedded with science, and whilst other forms of experimentation are emerging in art/archaeology, these are still often tied to interpreting the past. Experimental Geography provides us with a useful model for multifaceted, creative and self-reflective methods for the exploration of space. The following section develops the argument for experimental archaeologies that are concerned with and situated within the present, thus freeing archaeological practitioners from the need to interpret the past and allowing them to engage with different innovative forms of archaeological practice. Of particular interest here is our central theme of experimental mapping and how this can form a key part of archaeological practice.

The idea of an archaeology of the contemporary world is still quite new in archaeology, but has developed into a future-orientated and increasingly politically engaged subfield over the last ten or so years (Harrison and Schofield 2010:126–149; Badcock and Johnson 2013; Dixon 2013; Graves-Brown et al. 2013b:5–9; McAtackney 2013; Harrison 2016). The idea of applying archaeological methods of enquiry to the very recent past seems like a logical progression for the discipline, but this still requires archaeologists to look back, even if it is not very far. The most significant research in the subfield, and the most engaging and exciting for me in terms of both theory and practice, are future-orientated archaeologies of the present (for example, see Heritage Futures 2017). This is an archaeology that can nestle itself alongside anthropologists, geographers and artists, and collectively engage with the same events, happenings, places and materials in the process of them being made. In other words, such interdisciplinary collaborations can occupy the same temporality and physical space. As Graves-Brown et al. (2013b:9) suggest, part of the role of the archaeologist is to 'bear witness' to social and material action as it happens, with all the social–political consequences this can bring (e.g. migration, genocide, protest, marginalised communities and social change). Archaeology has to respond to pressing political, social and environmental issues. Jane Bennett's methodology for object orientated approaches is helpful here when she suggests that there must be 'a willingness to theorize events (a blackout, a meal, an imprisonment in chains, an experience of litter) as encounters between ontologically diverse actants, some human, some not, though all thoroughly material' (Bennett 2010:xiv). Returning to Deleuze and Guattari's call to 'make a map and not a tracing', this derives from a need to be 'entirely orientated toward an experimentation with the real' (Deleuze and Guattari 2004:13). In other words, to be directly in contact and engage with what is around us rather than rely upon translations or 'overcoding'. Brought together, and drawing upon philosopher Brian Massumi's (2011) analysis of the semblance of events, this could be summarised as an *event-orientated archaeology*. In order for archaeologists to fully realise this new found archaeological potential, we have to find new ways of practising archaeology. We *have* to experiment.

With this newfound level temporal playing field with other disciplines archaeologists should consider re-politicising practice. A good place to start would be to subvert the very practices that we take for granted in archaeology. We could very easily apply to archaeologies of the present the same techniques and methods that we use to investigate prehistoric landscapes, medieval settlements and wartime remains – measured survey, building recording, sample excavation etc. – e.g. the transit van excavation project (Bailey et al. 2009), the excavation of a council house (Buchli and Lucas 2001b). Although such projects inevitably provide new insights into 'familiar' objects and sites, and have been important projects in the development of this the sub-field, they still employ safe methodologies for an archaeologist. Instead, the practices, devices and processes that archaeologists use everyday (walking, mapping, surveying, writing, photography, GIS) should be subverted in order to explore new potentials and interpretations. In terms of mapping, Katherine Harmon suggests that geographers (and I would add archaeologists) obey certain mapping conventions with a certain visual language. Artists on the other hand disobey these rules and their 'preoccupations with ownership, spheres of influence, and conventional cultural orientations and beliefs' (Harmon 2009:10; although perhaps they also introduce their own rules instead).

As Rodney Harrison argues, archaeologists need to move away from the 'modernist trope of archaeology-as-excavation, and the modernist metaphor of excavation-as-investigation, alongside its construction as a discipline which is concerned with the abandoned, the disused and the dead' (Harrison 2011:143; see also Thomas 2004). New kinds of mapping are perhaps the obvious tool to explore his proposed 'alternative metaphor of archaeology-as-surface-survey' and archaeology as a 'process of assembling/reassembling' that will allow us 'to move forward in developing a viable archaeology in and of the present' (Harrison 2011:143–144). Indeed, the counter to the verticality of the excavation trope and depth metaphor Harrison (2011) critiques, is the *horizontal* explored through moving across the earth's surface with the body, for example walking (see Simonetti 2013:105–106). As Tim Ingold reminds us, rather than traversing surfaces by walking, 'we negotiate a way through a zone of admixture and interfaces' that make up the surface terrains of the earth (Ingold 2010:S122). Archaeologies of the present occupy this zone. An archaeology in and of the present is concerned with 'emergent futures' and 'future-assembling practices' (Harrison 2016:165).

The purpose of this chapter is to suggest that there is room for other types of experimental archaeology and that this experimentation could be a key tool for archaeologies in and of the present, unlocking the potential for archaeologists to push the boundaries of the discipline further. It is an attempt to interrogate and understand how archaeology uses the 'experiment' or 'experimental' in its discourse. It is clear that to *experiment* is firmly associated with positivist science, technological development and our understanding of the past at the moment. This relationship between experiment-science-past is a difficult one to untangle and experimental archaeology has become a loaded term. Archaeologists must explore other modes of practice beyond the scientific experiment and apply the notion of *creative* experimentation to theory and practice. I will now explore these ideas using some case studies from Orkney.

Orkney mappings

Collaborative mapping on Papa Westray

Between 2013 and 2014 Antonia Thomas and I were archaeologists in residence at a contemporary arts festival – Papay Gyro Nights – held yearly since 2011 on the island of Papa Westray, Orkney (known as Papay; see Papay Gyro Nights 2017). The festival brings together island tradition, folklore and new media art under the first full moon in February, the traditional night of the mythical Gyro. The week-long event attracts a small international audience of artists, other practitioners and locals in a varied and often-unpredictable curated programme of workshops, talks, music and screenings in various locations throughout the island. Having attending the festival from the beginning, we had come to know the organisers and many of the sixty or so fulltime island residents. When invited to be archaeologists in residence, it was an opportunity to expand upon mutual art/archaeology explorations of the last few years and to experiment with archaeological practice in a context where experimentation was the norm.

The idea of an 'archaeologist in residence' was, and still is, something quite new to the discipline of archaeology, residencies being more commonly established in an arts environment (Lee and Thomas in prep). There is not the space to elaborate on this here, beyond that the residency was approached as a means of expanding our collaborative field of practice as archaeologists without the pressure of usual outcomes or responsibilities (Lee and Thomas 2013, in prep). The only loose parameters (set by us and not the organisers, who gave us free rein) were to use the archaeological walkover survey as a method of enquiry, in direct response and with the intent of developing Harrison's (2011) proposition for an archaeology of surface survey. Walkover surveys are commonly used by archaeologists to prospect, map and characterise the archaeological resource in a given area. They are low-tech and use basic equipment: a handheld GPS receiver, camera, scale, paper record sheets and experience. A second parameter was to focus, although not exclusively, upon materials and sites of the very recent past and present. Apart from these original loose parameters, the residency was process-led (see Gosden and Malafouris 2015 on process) and modes of enquiry were shaped by experiences and encounters *as we went along*. Activities soon settled upon exploring the contemporary archaeologies of the island as a means of thinking through and contextualising archaeologies of the festival.

Archaeological traces of the present exist at a range of scales and materials on Papay. Plastic beach litter links the island with issues of global pollution and 'hyper-objects' of the Anthropocene (following Morton 2013), whilst reused ships' cargo references unreached destinations, heroic rescues and tragedies (Lee and Thomas 2013). Dumps of domestic items and the tradition of using abandoned cars as animal shelters in fields ('field cars') signal local attitudes to disposal and reuse. Records consisted of GPS waypoints and tracks, field notes and photographs. The walkover survey of these island sites and materials was carried out in conjunction with a study of the spaces and materials of the festival as they were generated, inhabited, assembled and re-assembled. We recorded the construction, opening, duration and deconstruction of a sound piece in the byre at Vestness farm by Norwegian artist Signe Liden. Workshops by Hong Kong artist Frog King, audio-visual performances, photographic workshops, group lunches, material found on walks on the beach became recorded as sites. They became part of a communal map in a flow of time, space and materials.

Spatial mapping soon came to the fore in the recording process; the traces made by the GPS tracks began to take on new forms. During the 2013 festival, most of the mapping was undertaken by the archaeologists; by the end of the 2014 festival (with numerous visits to the island in between), multiple hand-held GPS (up to seven at once) were used by artists, festival-goers and locals at the same time, Figure 7.4. Makeshift

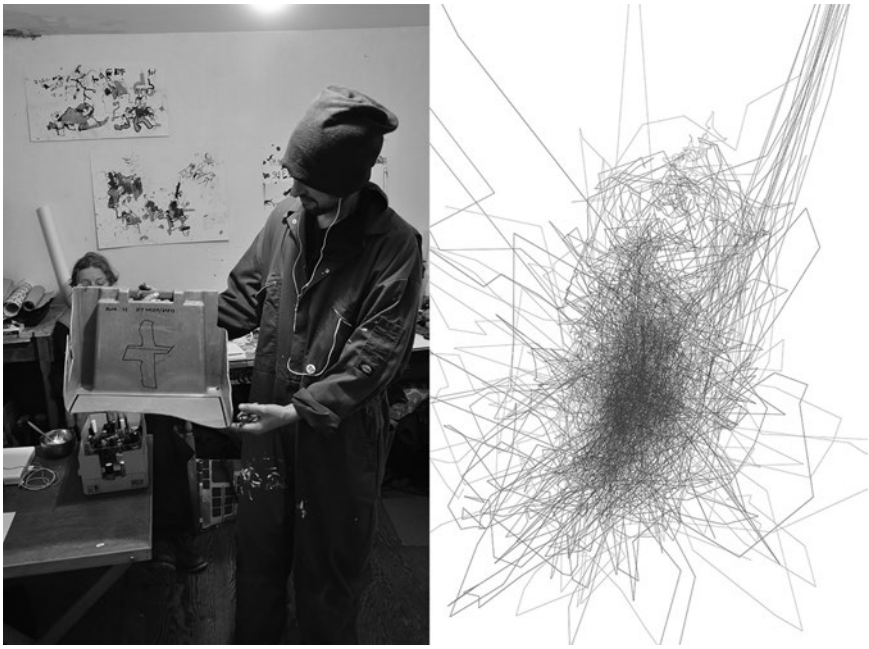


Figure 7.4 Artists Brendan Colvert and Rosey Priestman in their Papay Gyro Nights 2014 studio space with their combined GPS tracks over several days for the same space (Photograph and map by author).

artist studios in the main festival centre (the organisers' house and studio) were mapped and recorded as they were used each day. The construction of a sauna, fire shelter, visits to the shop and talks; the everyday journeys, places and materials of the festival and the spaces in-between were mapped as they began to emerge and then dissipate. Like Robert Smithson's 'array of artworks [at construction sites] that *vanish* as they develop' (Smithson 1967:58 original emphasis), the residency was finding new ways of recording 'sites in the making' archaeologically. Collaborative co-production led to the production of archaeologies *with*, rather than an archaeology *of* the festival, moving with these spaces and materials into the future (Lee and Thomas 2013; Lee 2016:20).

The GPS mapping started to generate new forms and spaces as a multitude of lines converged to show repeated movement through time in the same spaces; mapping the festival assemblage. The data was downloaded each day, tagged by participants, and combined in AutoCAD and then GIS. There was no need for a base map as a new and far more relevant one was emerging from the recording process. The GPS seemed to be taking on its own materiality in the convergence of lines and movement through spaces. The lines seemed to go beyond the qualities and criteria of a simple map (scale, accuracy, clarity) and invent their own shapes, intersections and meaning. How could this mass of data be pushed further? How could the archaeological GPS map be taken to another level? New maps resulted from the combination of GPS data between all participants. The multiple over layering of tracks produced complex space-time maps. If this data was time-clipped to single event durations at the festival, combined and reordered by time, collaborative maps emerge to show the generation of space and material conditions *between people at the same time* with a group of passive mappers attending and interacting with the event (see Lee 2014).

The result is a new kind of archaeological map: one that defies scale, order, navigation, realism and visual references, yet captures some essence of the social and material conditions of that event, Figure 7.5. It is not meant for navigation or wayfaring (see Gell 1985; Ingold 2000); it is a different kind of map that plays on the process above the traditional output. It is non-representational, or more precisely, *more-than-representational* (see Lorimer 2005). It remains spatial, generated from Cartesian rules and coordinates, but the grid is subverted; this map is counter-grid.

Island walk

The above is a form of what might be termed *passive mapping*, where the mapper follows usual routes and records lines 'as they happen'. It is unpredictable and depends upon the participants' engagement with the material and space around them (Lee 2016:20). This can become combined at a specific event, or become dispersed as they moved themselves in other places, in this case at the festival or on the island.

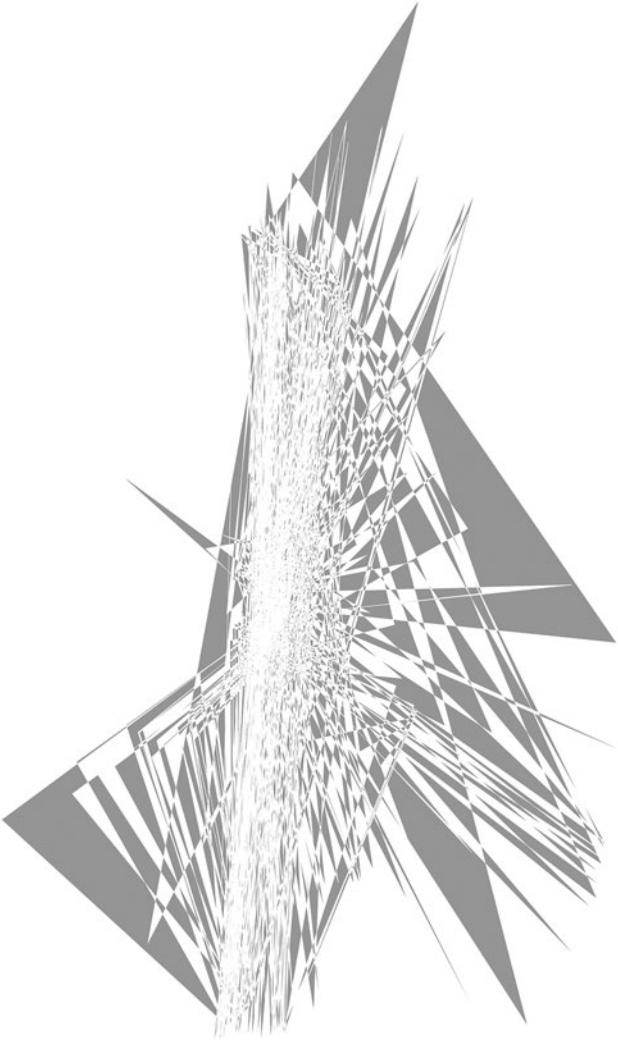


Figure 7.5 Collaborative GPS map of '*Runes, Fate, Magic and the Ragnarok*', a talk by Ragnhild Ljosland (18/02/14: 1400–1459 hrs. Map by author).

Active mapping where the deliberate movement across the room or landscape draws lines with the body in space, developed out of the passive mapping (Lee 2016:20). Walking and mapping on Papay and Mainland Orkney explored the performative aspects of active mapping in the landscape as part of an archaeology of the present and thinking visually through the process.

One February morning in 2015 I walked around the island in order to reference all of the experiences, sites and mappings of the residency and collaborations of the previous two years. The walk employed the active mapping process described above. In walking the coast, understanding the technique, seeing the lines in the landscape, the map was the result of thinking visually through the project assemblage and island; a translation of the mental and artefactual map. It was a performance that sends the project into the future as lines of becoming (Deleuze and Guattari 2004:323). It was not intended to represent a final piece or finale, but rather the latest thread in an ongoing conversation.

> **7th February 2015, 8am**
>
> I rose early and had breakfast. The family were still asleep. I packed a small rucksack and set off into the grey rain. Showers were forecast, and the first few were heavy. They drove into my face from the west as I headed to the shore. This was my chance, I wasn't going to let this opportunity go. I wasn't sure when it would come round again. I was going to walk around the whole island, in one go, without stopping. This was to be some kind of finale to everything, but perhaps also a beginning.
>
> I walked up the road past the red doors of Holland Farm and down the track to Knap of Howar, Papay's pair of Neolithic houses on the west coast of the island, sunk into the ground like giant footprints. GPS 3 was in my pocket. A corner of the chain link fence which surrounds the site was chosen as the marker for the start of the walk.
>
> Time check, 8:07 am. Head North.
>
> (Lee and Thomas 2015:6)

As well as mapping and recording the festival and island, the residency involved collaborating with artists. The most sustained collaboration (one that still continues) was with Norwegian photographer Tonje Bøe Birkeland. Birkeland's work enacts a series of fictional women – The Characters – and combines narrative writing, prose and photography to retell the story of their adventures. Through collaborating with our mapping, Birkeland has also started to experiment with a spatial dimension in her work. During 2014 we enacted the story of character Luelle Magdalon Lumiére (1873–1973), a stereo photographer, whose travels during the early twentieth century took her to New York and Scotland, finding her way to Orkney and Papa Westray (Birkeland 2016). The more these characters become played out in the present, the more they become real. Her work disrupts the boundaries between real and imaginary, past and present. Part of our role as archaeologists was to start to map the more tangible traces of Luelle's walks and explorations, Figure 7.6. Through revisiting spaces, they became sites, and places. Our memory maps merged with Luelle's and we followed her adventures whilst at the same time making them happen. The GPS mapping tracked the lines walked and conversed. Eventually, we were able to find Luelle's initials 'LL' carved in the cliff top at the north end of the island (SITE 71); a tangible mark of the imagined.

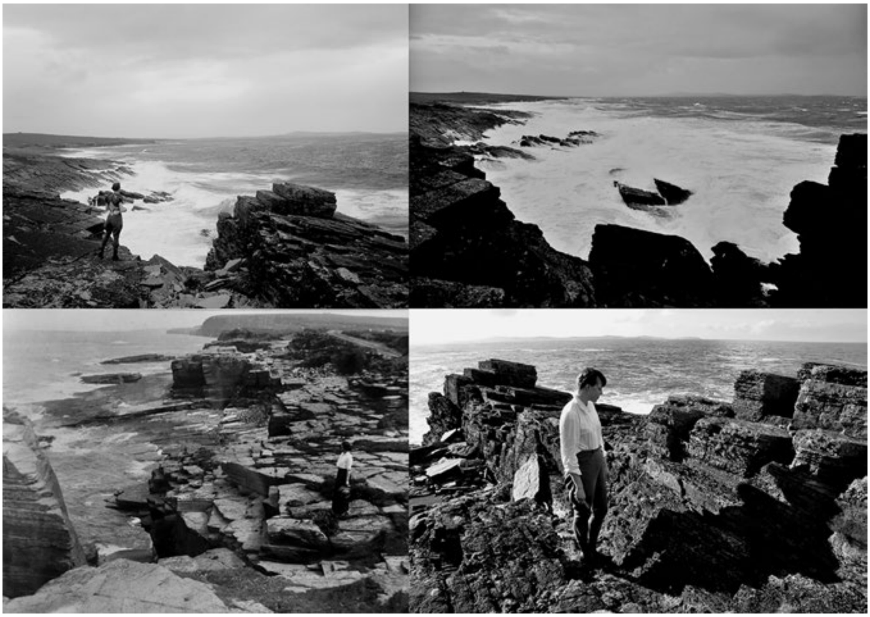


Figure 7.6 SITE 71: Luelle Magdalon Lumiére, Papa Westray 2014 (photographs clockwise from top left by: Tonje Birkeland, Dan Lee, Antonia Thomas, Unknown).

7th February 2015, 9am

I knew exactly where the place was. I had seen all of the photographs, maps and tracks. I could picture the tabular rock tipping into the sea looking down the west side of the island. My walk hugged the west shore to the north end of Papay. The air was mild and close with a fine mist, Westray barely visible. I had been here before. My imagined route drew me on to the place; I think I can see it as the beach cliff rises further north. Following a spur I can see the gulley, with folded rock billowing and then ending abruptly with the drop.

I sense everything converge as I walk straight up to it – LL – as if it was carved yesterday. I ran my fingers through the letters. Lines carved in the rock. Somehow, it acted as a pivot: memories, people and place enmeshed. It seemed like she was standing with me gazing out across the sea. A scene I was remembering through the photograph. She was closer to the edge than I dared, gazing across the sea to Westray, hands clasped, heel raised. Waves crashing onto the sloping rocky shore below.

(*Lee and Thomas 2015:10*)

The collaboration with Tonje and Luelle has been published in an experimental paper (Lee and Thomas 2015; republished in Birkeland 2016). This combines narrative text, memories, materials, experiences, maps and images (see Figure 7.6). Together, they have become a new form of experimental map. The format of the article demonstrates that archaeological maps have the potential to contain more than spatial data; an important point we shall revisit below in the Map Orkney Month case study. In addition, as Simonetti (2013:105–106) suggests, walking introduces a new conceptualisation of time as horizontal, as opposed to vertical time more typically employed in archaeology and geology. Again, the method of walking and mapping helps to further erode the depth metaphor trope in archaeology (Harrison 2011). Walking, therefore, explores new relationships with time; as Simonetti (2013:106) concludes 'ultimately, understanding the history of time depends on the body as both concepts and practice unfold in movement'.

> **7th Februray 2015, 11am**
>
> Rounding Vest Ness and turning north. The final walk up the west side of the island. Recent storms had smashed the wrecked creel boat into smaller pieces than the last time I was here, and shifted its position on the shore.
>
> North-westerly winds had stiffened and blew salt spray into my face. Fulmars surfed effortlessly the strong updraft from the low beach cliff by the sculptures of beach bruck. Walking was tough and my legs were tired. This was a well-trodden path and a familiar walk, first made several years before. I could picture the end and imagine the shape of the shore. Rounding the brae, the fence came into view, the post set in concrete on the coastal defences for the Knap of Howar. Back to the beginning, reaching the end (Figure 7.7).
>
> Time check: 11:59.
>
> (Lee and Thomas 2015:13)

Map Orkney Month

During March 2015, a new experimental map of Orkney was produced (Figure 7.8) during Map Orkney Month. The project formed part of Public Archaeology 2015, a series of month-long projects throughout the UK aimed at engaging the public in archaeology (Dixon 2014). Drawing on our work on Papa Westray, the idea was to conduct a participant-led countywide walkover survey using basic GPS receivers, photographs, text, sound and video. Each of the thirty participants mapped with a hand-held GPS or their smartphone for a day. This was to be a counter-map of everyday journeys, daily routines, heritage and archaeology. The political edge was a challenge to the official and authorised maps of archaeology and the Ordnance Survey, and also challenging notions of archaeological value; who makes history and how is this done?

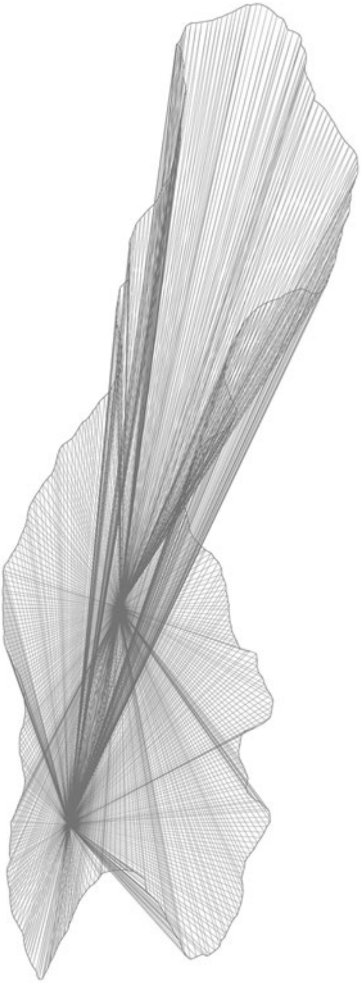


Figure 7.7 Gathering the fragments, encircling the island 3:52 hrs (Map by author).

Originally, my aim for Map Orkney Month was to produce a new map of the archipelago by combining all the results from participants once they had mapped their day. In the end, the making of the map, the *mappings* (Kitchin and Dodge 2007), would bring unexpected sites into our consciousness and come to the fore. They would 'generate' new heritage by bringing the unnoticed and everyday to our attention. As the contributions came in from participants, and the weekly blog posts started to develop, what stood out was the creativity and strength of the contributions in themselves. The

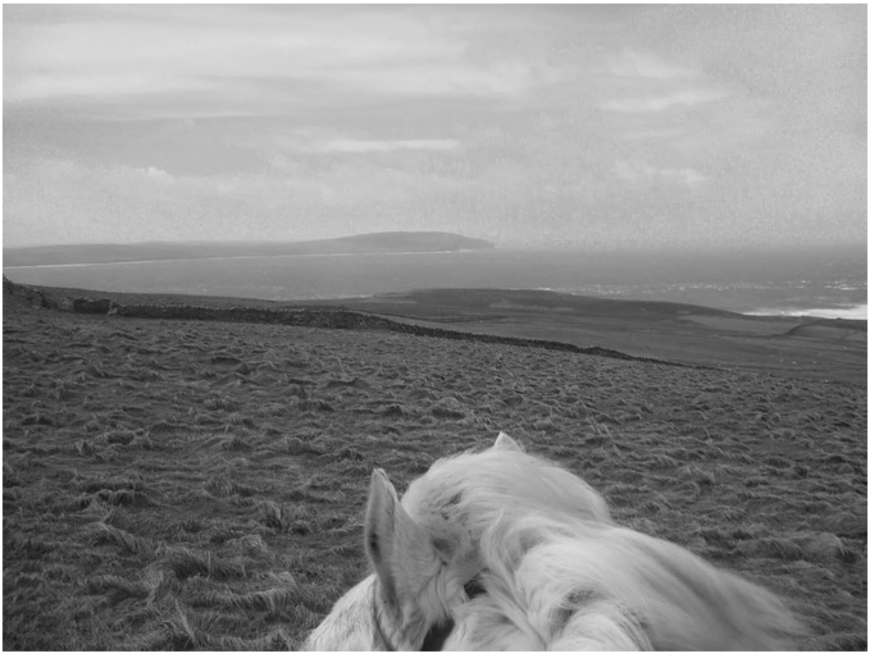


Figure 7.8 Jo Inkster, Rousay 01/03/15. '*A typical Sunday on the farm for this time of year. Cattle feeding duties followed by a wet and windy hack out on my favourite horse Storm. Rode out to the Westside of Rousay and my Waypoint picture is taken looking out over Quandale (site of the General Burrough's Clearances) towards the Mainland. The rest of my day was spent with more cattle feeding, a quick dog walk and some time in the workshop.*'

project was never about mapping *everywhere*, and the GPS was a tool to encourage heritage engagement. It soon became evident that in order to do justice to the mapping assemblage, I had to withdraw myself even further from the outcomes and let them speak for themselves. Each contribution *was a map*, combining images and short text descriptions which took readers into the world of the participants. Rather than reducing them to icons, dots or a photo montage (one original idea was to make a leaflet), the blog posts were allowed to tell the story as it happened. It became clear that the strength of the project was, in fact, that there was no final map (Figure 7.9). The experimental mapping became politicised against the authority and control of the archaeologist (me) in favour of a democratised biography of people and things.

This section aims to give a flavour of the individual mappings and quotes from the original participant contributions (for more details, see Lee 2016). The choice of what to map was left up to the mapper, they just had to undertake it on their chosen day (Figure 7.10). Contributions were varied.

Figure 7.9 Helga Tulloch, North Ronaldsay 04/03/15. '*Isabella and I went out between planes to feed the sheep at Cruesbreck and hens at Verracott, pick up a dehumidifier and managed to fit in a walk round the West Beach and pancakes at Purtabreck.*

Some participants were more passive with their mapping, recording everyday journeys, walks, and the normal routine (Diana Leslie, for example, drawing the harbour at Stromness between trips to the coop and laundrette). Others made slight detours to a place they wanted to share (Mark Cook and the Houton view point, Mainland Orkney). Alan Craigie took his favourite walk during a normal working day to the WWII battery at Hoxa Head, on South Ronaldsay. Maureen Flaws walked around the west shore on Wyre. Several people carried out tours of their island, showing the heritage highlights or visiting a place that was important to them and recording this with the GPS tracks, photographs and text. Chris Gee walked to a favourite ancient mound with his family in Rendall, Mainland Orkney; Hazel Moore recorded a photo essay of a ferry trip from Westray to Kirkwall; Doris Shearer took us on a walk and car trip around Stronsay. These contributions demonstrated how heritage is woven into daily lives, something that the shifts in scale inherent in any final map could potentially lose.

Some of the more unexpected contributions were the more choreographed. Some mappers undertook mini projects where they studied an area or undertook specific tasks. For example, Rosey Priestman and Brendan Colvert mapped the model farmstead of Stove, Sanday, by walking repeatedly around the buildings and created a mapped circle in the sands of the bay. Ian Garman introduced his intriguing hobby of 'phonebox conferencing' to the project. This involves cycling to red telephone boxes, tweeting the telephone number and inviting people to call for a chat. His idea is to use the telephone boxes in order to slow their demise along with highlighting this iconic technology in obsolescence. Part of the challenge is that the telephone may not work, when perhaps it did before, or that it takes incoming calls but no longer rings (you just have to keep picking up the receiver in case someone is calling). Ian visited and mapped some of the red telephone boxes

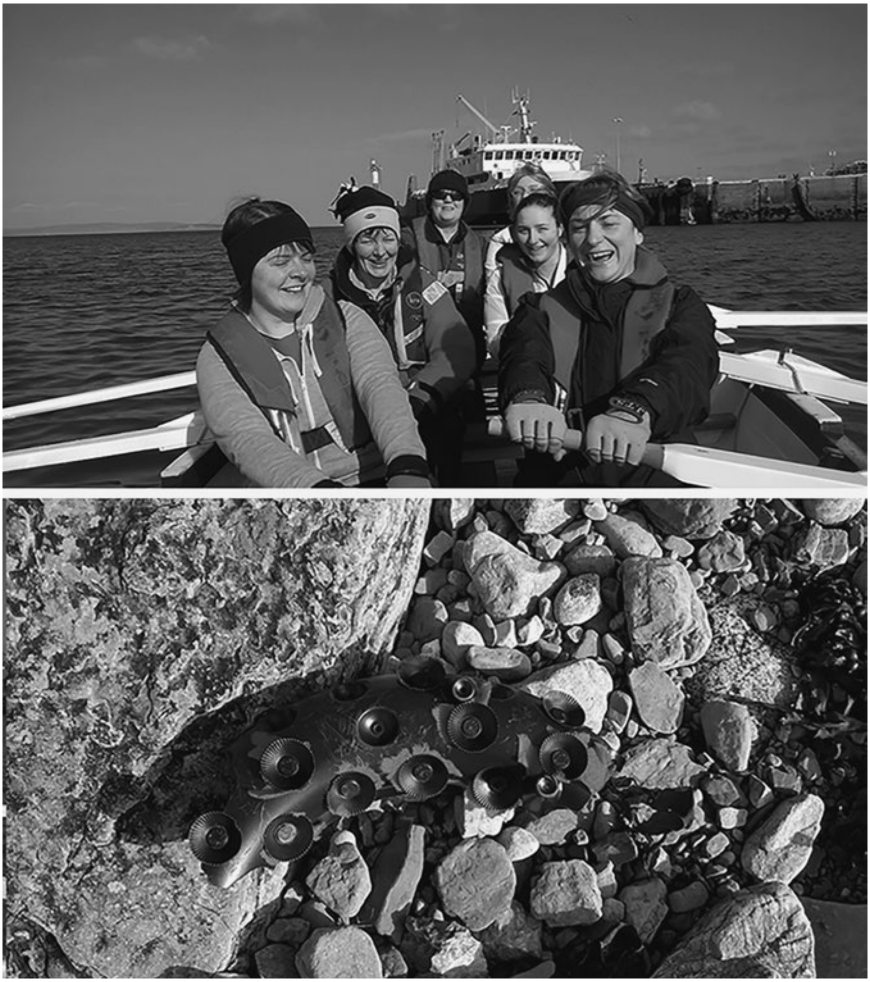


Figure 7.10 Rowena Baker, Kirkwall Bay 15/03/15. *'My mapping day started with feeding the hens and helping my daughter revise for her National Fives. We both then went to Hatson Slip for rowing practice with the Orkney Rowing Club, rowing a traditional Fair Isle Yole and getting a 'Viking Eye' view of the Orkney landscape. Afterwards, back home and more revision, followed by a walk down the field to the shore from where we can see the buoy marking the site of the Royal Oak (sunk by a German U-boat in 1939 during WWII). While walking along the shore and within sight of the Royal Oak buoy I found part of a poppy wreath that may have been laid down on the wreck on the 14th October to commemorate the loss of 883 young lives.'*

in the Orkney West Mainland and spoke to six people from elsewhere during his conference calls. As before, the map came secondary to the material and social encounters; the assemblages of photographs, stories, happenings bound up in the sensitivity of the contributions (Figure 7.11).

Imagination became an important theme. In an effort to include people from elsewhere during the national Public Archaeology 2015 project, I made a call for imaginary contributions that could be transposed onto the Orkney map. Within Orkney, Rebecca Marr took us on an imaginary tour of the islands through the work of Swedish photographer Gunnie Moberg using her photographic archive held in the Orkney Library and Archive. Further afield, members of the Public Archaeology team followed an imaginary tour of Orkney following a route with some prompts devised by James Dixon. This resulted in places from around the UK becoming translated onto the Orcadian landscape. Following this psychogeographical theme, Lara Band and Dave Webb undertook a tour of an area of east London containing the equivalent population of Orkney following Dixon's prompts. This small patch in the city became a map of the archipelago. Dave and Lara have since visited Orkney and undertaken a tour of the actual places they had imagined in London, and created a split screen audio-visual experience juxtaposing the two mappings: *An Imaginary Tour of Orkney,* and *Orkney from Elsewhere* (Band and Webb 2016) (Figure 7.12). Their conversation continues.

From simple beginnings, Map Orkney Month developed into something much more complex than a map. The project was process-led and allowed the participants to take the lead. This created a diverse assemblage

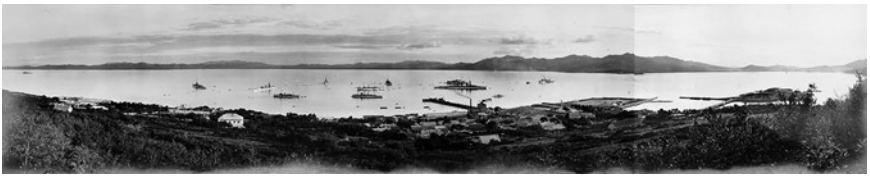


Figure 7.11 Mark Cook, Kirkwall and Houton 07/03/15. '*A typical day in the taxi never knowing where my journey will take me and who will be my traveling companion. Sometimes they are regulars and we have a few minutes to blether and catch up, other times it's someone I've not met before, and like speed dating on wheels I have a limited time to find out about their story! My photo is a large panoramic print that's approximately 100 years old. We were given it as a present nearly 20 years ago and told it was Scapa Flow in Orkney. We had for many years wanted to visit Orkney, and when we finally did we brought the picture with us to find the location, and quickly confirmed it was not around Orkney after all and also noticed it was inscribed 'Wei Ha Wei, China'. Nevertheless, we loved Orkney and 9 months later had moved here. The picture, therefore, is an imaginary view from Houton Tower which I visited on the way home on Saturday.*'

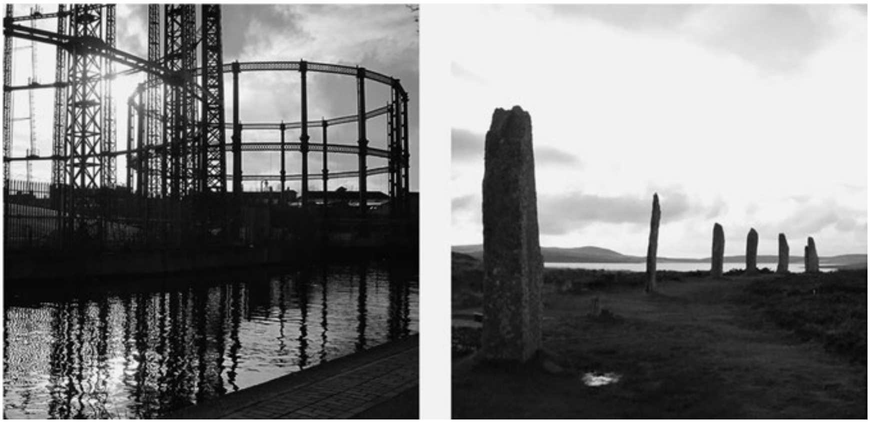


Figure 7.12 Still from '*An Imaginary Tour of Orkney, and Orkney from Elsewhere*': Ring of Brodgar (Band and Webb 2016, used with permission).

of mappings that told a different story of Orkney. The more this counter-mapping progressed the more it challenged archaeological tradition, authority and power structures (Lee 2016:14). The notion of the map and the use of GPS receivers choreographed the project without being the final outcome: the map has been masked *behind* the mapping. In addition, 'imaginary sites blur the distinction between reality and non-reality, fact and fiction and past and present as the Map Orkney Month archive moves into the future' (Lee 2016:17). The map, enriched by the experience of the mapping, is left to your imagination – a subversive notion given the usual positivist maps used by archaeology.

Conclusions

This chapter has set out new ideas for experimental mapping in archaeology, in both theory and practice, and called for archaeologists to experiment. For this discussion, it has been necessary to take a step back, and think about what we mean by 'experimental' and 'maps/mapping' in the discipline. In the UK, archaeology has a long history with survey and maps, largely mirroring the development of the Ordnance Survey and the authorising of the landscape during the nineteenth and twentieth centuries. Archaeological mapping remains very traditional and is firmly wedded to the Cartesian grid. In the discussion of how archaeologists experiment it was shown that experimentation is quite normal, however this is partly embedded in reductionist and positivist scientific endeavours in the laboratory or subfield of Experimental Archaeology. Different kinds of experimentation have been emerging over the last couple of decades where archaeology comes into contact with arts practice and theory. Recent Art/Archaeology interactions have produced a lively body of research and introduced new forms of experimentation into the discipline. Most Art/Archaeology commentators, however, remain as commentators and not practitioners (see Russell and Cochrane 2014; Bailey 2017a; Bailey 2017b for recent summaries). Experimental Geography has brought new forms of critique to geography's (and art's) relationship with space. Approaches from this innovative subfield of cultural geography have had surprisingly little impact on archaeology, an imbalance the earlier discussion aims to redress. Contemporary Archaeology, as a new and innovative subfield, has the opportunity to embrace experimental practice as normative practice rather than as something additional.

The issue of time remains the central challenge for archaeologists in how we experiment and map. The limitations of some Art/Archaeology projects is that they restrict themselves to the interpretation of the past. It is not the intention here to polarise the role of experimentation for interpreting the past and the present. Interpreting the past as we make it remains one of the central roles of archaeology in science and the humanities. However, the point being developed here is that archaeology has yet to fully realise the ways in which different forms of experimentation can be used to explore archaeologies of the very recent past and present. This is perhaps the main reason why experimental geography, and the critique of the production of space, has failed to impact archaeology and encourage archaeologists to counter-map and be critical with cartography. It is argued here that cartographic experimentation with archaeologies *of the moment* might provide new and productive ways of exploring the generation of material and human/animal conditions as they happen. Archaeologies of the present are inherently interdisciplinary and facilitate the experimentation of archaeological practice as the archaeologist shifts from translator to active agent. Archaeologies of the present *demand* that we find new ways of practicing archaeology. As such, this chapter has made the case for archaeologists to step out of the grid (metaphorically and physically) and experiment with mapping. There is a need to find new ways of charting people and things as they assemble and reassemble (Harrison 2011). Mapping is one tool that can be developed to explore an *event-oriented archaeology* of the present for the future. Our three experimental mapping case studies – the circular walk, Papay mappings and Map Orkney Month – are explicitly not about interpreting the past. They demonstrate the potential for experimental process-led mapping in archaeology that investigates the relationship between people and things (past and present) in the contemporary world, and how this approach is orientated towards the future.

I want to conclude the chapter with some provocations for archaeological mappings:

- Reject traditional archaeological maps and disrupt the grid.
- Take risks. Do not be afraid to experiment with your own material. Make time to do so because it will send you in new directions.

- Take a device or process you use in your everyday practice and take for granted: Subvert it.
- Allow the mappings to mask the map.
- Think multi-sensorially (visually, aurally etc.). Plan for the outcomes of mappings and creatively engage with practice, rather than relying upon traditional realist translations of sites and landscapes. Experiment with different ways of visualising your mappings and data. These could be ambiguous, abstract and more-than-representational.
- Think horizontally. Engage with surfaces.
- Experiment with different ways of writing about and sharing your mappings and surveys. Use narrative text, prose, mappings, images to convey material encounters, mental maps and wayfaring.
- Take these approaches and apply them to the study of the past in order to disrupt established practices.
- Politicise your projects, by first challenging what is taken for granted in archaeology, and engage with other social-political situations.
- Be confident in your subject area and take that archaeological sensibility to other disciplines and collaborations.

Acknowledgements

Parts of this chapter originated from a paper presented at the European Association of Archaeologists Conference 2015, Glasgow, in the Creative Archaeologies session (LV6) which I co-chaired. For more information on recent projects and mappings see our project blog (Lee and Thomas 2017). Thanks to the editors of this volume for helpful comments and allowing me to develop these ideas further. Thanks to Mark Edmonds and Antonia Thomas for commenting on earlier drafts. Any omissions are my own. Thanks to Papay Gyro Nights Contemporary Art Festival, Papay Westray, Orkney, for inviting Antonia Thomas and me to be Archaeologists in Residence (2013–2014). Special thanks to Tonje Bøe Birkeland for use of her photographs, and to participants of Map Orkney Month; in particular Jo Inkster, Helga Tulloch, Rowena Baker and Mark Cook for their contributions which have been shared in full here. Thanks to Lara Band and Dave Webb for allowing me to reproduce an extract from *An Imaginary Tour of Orkney, and Orkney from Elsewhere*. Thanks to Antonia Thomas for her continuing support! This chapter is dedicated to Henry, who arrived in the middle of writing it.

Notes

1 The Peedie Sea (also known as the Peerie Sea, meaning ‘small sea’) is the last remnant of a large shallow sea inlet, previously known as The Oyce, to the west of Kirkwall town centre now consisting of a shallow pool and circular model boating lake. It was originally separated from Kirkwall Bay to the north by a long shingle spit called The Ayre which in the nineteenth century had a tidal mill at the end, known as Ayre Mills.

2 The stratigraphic or Harris matrix, a systemic flow diagram that represents the sequence of layers and structures in an excavation in order of time (Harris 1989; Roskams 2001:153–168), is another form of reductionist 'grid' that translates the complexity of occupation to a series of a-temporal fixed points. Despite criticisms, such as a lack of temporality and duration (Chadwick 1998; Lucas 2001:161–162, 2005:38–40; Simonetti 2013:100–103), the matrix 'grid' is still widely used in field archaeology.

3 Archaeological excavations are of course artefacts in themselves, carefully manufactured by archaeologists to form a new kind of object. These excavation-objects are designed to help us understand the past through sampling it. However, they present an entirely new version of the past through exposing an assemblage of material surfaces never before combined. Archaeological plans of trenches are therefore maps of excavation-objects and artefacts themselves. Some excavations, through global outreach and media, even become hyper-objects (Morton 2013), only part of which we are actually able to map at one time.

4 Perhaps not in the case of indigenous land rights, community claims, erased communities. These are themes typically covered by heritage studies (e.g. counter mapping indigenous communities in Australia, Harrison 2004; mapping the 'peace walls' of Belfast, McAtackney 2011), but for the mainstay of Western archaeology, the map (and the mapping) has become passive and a-political.

5 Of note is that the otherwise comprehensive *Oxford Handbook of the Archaeology of the Contemporary World* (Graves-Brown et al. 2013a) does not contain a section or significant discussion about space or mapping.

References

Aitken, M.J., (2013) *Science-Based Dating in Archaeology*. Routledge, London and New York.

Aldred, R.O., (2014) *An archaeology of movement: A methodological study*. PhD thesis, University of Iceland, Reykjavik.

Badcock, A., Johnson, R., (2013) Protest. In Graves-Brown, P., Harrison, R., Piccini, A. (eds.) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford, pp. 321–335.

Bailey, D.W., (2014) Art//Archaeology//Art: Letting-Go Beyond. In Russell, I.A., Cochrane, A. (eds.) *Art and Archaeology: Collaborations, Conversations, Criticisms*. Springer, New York and London, pp. 231–250.

Bailey, D.W., (2017a) Disarticulate – repurpose – disrupt: Art/archaeology. *Cambridge Archaeological Journal* 27(4):691–701.

Bailey, D.W., (2017b) Art/Archaeology: What value artistic-archaeological collaboration? *Journal of Contemporary Archaeology* 4(2):246–256.

Bailey, G., Newland, C., Nilsson, A., Schofield, J., (2009) Transit, transition: Excavating J641 VUJ. *Cambridge Archaeological Journal* 19(1):1–27.

Band, L., Webb, D., (2016) An Imaginary Tour of Orkney, and Orkney from Elsewhere. Audio-visual installation presented at the Contemporary and Historical Archaeology in Theory conference 2016, RURALITY, Kirkwall, Orkney 21–23/10/16. Available at: www.youtube.com/watch?v=7FLp-JIZfKI accessed 28/11/16.

Barceló, J.A., Forte, M., Sanders, D.H. (eds.), (2000) *Virtual Reality in Archaeology*. BAR International Series 843. BAR Publishing, Oxford.

Barker, P., (1993) *Techniques of Archaeological Excavation*, 3rd Edition. Batsford, London.

Bender, B., (1993) Introduction: Landscape – Meaning and Action. In Bender, B. (ed.) *Landscape: Politics and Perspectives*. Berg, Oxford, pp. 1–17.

Bender, B., Hamilton, S., Tilley, C., (1997) Leskernick: Stone worlds; alternative narratives; nested landscapes. *Proceedings of the Prehistoric Society* 63:147–178.

Bender, B., Hamilton, S., Tilley, C., (2007) *Stone Worlds: Narrative and Reflexivity in Landscape Archaeology*. Left Coast Press, Walnut Creek, CA.

Benjamin, W., (1978) *Reflections*. Schocken, New York.

Bennett, J., (2010) *Vibrant Matter: A Political Ecology of Things*. Duke University Press, Durham and London.

Birkeland, T.B., (2016) *The Characters I–IV*. Bergen Kjøtt publishing, Bergen, Norway.

Bowden, M. (ed.), (1999) *Unravelling the Landscape: An Inquisitive Approach to Archaeology*. Tempus, Stroud, UK.

Buchli, V., Lucas, G. (eds.), (2001a) *Archaeologies of the Contemporary Past*. Routledge, London and New York.

Buchli, V., Lucas, G., (2001b) The Archaeology of Alienation: A Late Twentieth-Century British Council House. In Buchli, V., Lucas, G. (eds.) *Archaeologies of the Contemporary Past*. Routledge, London and New York, pp. 158–167.

Chadwick, A., (1998) Archaeology at the Edge of Chaos: Further towards Reflexive Excavation Methodologies. Assemblage 3. Available at: www.assemblage.group.shef.ac.uk/3/3chad.htm accessed 27/11/16.

Coles, J., (1973) *Archaeology by Experiment*. Hutchinson and Co. Ltd, London.

Coles, J., (1979) *Experimental Archaeology*. Academic Press, New York.

Cosgrove, D., (1984) *Social Formation and Symbolic Landscape*. Croom Helm, London.

Crampton, J.W., Krygier, J., (2005) An introduction to critical cartography. *ACME: An International E-Journal for Critical Geographies* 4(1):11–33.

Deleuze, G., Guattari, F., (2004) *A Thousand Plateaus*. A&C Black, London.

Dixon, J.R., (2013) Two Riots: He Importance of Civil Unrest in Contemporary Archaeology. In Graves-Brown, P., Harrison, R., Piccini, A. (eds.) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford, pp. 565–577.

Dixon, J.R., (2014) Project Details. Public Archaeology 2015 Blog. Available at: https://publicarchaeology2015.wordpress.com/project-details/ accessed 28/11/16.

Forte, M., Dell'Unto, N., Issavi, J., Onsurez, L., Lercari, N., (2012) 3D archaeology at Çatalhöyük. *International Journal of Heritage in a Digital Era* 1(3):351–378.

Gallagher, M., Prior, J., (2013) Sonic geographies: Exploring phonographic methods. *Progress in Human Geography* 38(2):267–284.

Garrett, B.L., (2011) Videographic geographies: Using digital video for geographic research. *Progress in Human Geography* 35(4):521–541.

Gell, A., (1985) How to read a map: Remarks on the practical logic of navigation. *Man* 20(2):271–286.

Gonzalez-Ruibal, A., (2006) The past is tomorrow: Towards archaeology of the vanishing present. *Norweigen Archaeological Review* 39(2):110–125.

Gosden, C., Malafouris, L., (2015) Process archaeology (P-Arch). *World Archaeology* 47(5):701–717.

Graves-Brown, P., Harrison, R., Piccini, A. (eds.), (2013a) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford.

Graves-Brown, P., Harrison, R., Piccini, A., (2013b) Introduction. In Graves-Brown, P., Harrison, R., Piccini, A. (eds.) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford, pp. 1–26.

Hacigüzeller, P. (2017) Archaeological (Digital) Maps as performances: towards alternative mappings. *Norwegian Archaeological Review* 50(2):147–171.

Harmon, K., (2009) *The Map as Art: Contemporary Artists Explore Cartography*. Princeton Architectural Press, New York.

Harris, E., (1989) *The Principles of Archaeological Stratigraphy*, 2nd Edition. Academic Press, London.

Harrison, R., (2004) 'Counter-Mapping' Heritage, Communities and Places in Australia and the UK. In Schofield, J., Szymanski, R. (eds.) *Local Heritage, Global Context: Cultural Perspectives on Sense of Place*. Ashgate, Farnham, UK, pp. 79–98.

Harrison, R., (2011) Surface assemblages: Towards an archaeology in and of the present. *Archaeological Dialogues* 18(2):141–161.

Harrison, R., (2016) Archaeologies of emergent presents and futures. *Historical Archaeology* 50(3):165–180.

Harrison, R., Schofield, J., (2010) *After Modernity: Archaeological Approaches to the Contemporary Past*. Oxford University Press, Oxford.

Hawkins, H., (2014) *For Creative Geographies*. Routledge, New York and London.

Hawkins, H., (2017) *Creativity*. Routledge, New York and London.

Heritage Futures, (2017) Heritage Futures Project Website. Available at: https://heritage-futures.org/ accessed 28/11/16.

Hewitt, R., (2010) *Map of a Nation: A Biography of the Ordnance Survey*. Granta Publications, London.

Hodder, I., (1986) *Reading the Past: Current Approaches to Interpretation in Archaeology*. Cambridge University Press, Cambridge.

Hodder, I., (1999) *The Archaeological Process: An Introduction*. Blackwell, Oxford.

Holtorf, C., (2015) Are we all archaeologists now? Introduction. *Journal of Contemporary Archaeology* 2(2):217–219.

Holtorf, C., Piccini, A. (eds.), (2009) *Contemporary Archaeologies: Excavating Now*. Peter Lang, Frankfurt.

Ingold, T., (2000) *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. Routledge, London.

Ingold, T., (2010) Footprints through the weather-world: Walking, breathing, knowing. *Journal of the Royal Anthropological Institute* 16(s1):S121–S139.

Kitchin, R., Dodge, M., (2007) Rethinking maps. *Progress in Human Geography* 31(3):331–344.

Krauss, R., (1979) Grids. *October* 9:50–64.

Last, A., (2012) Experimental geographies. *Geography Compass* 6(12):706–724.

Lee, D.H.J., (2014) Collaborative Drawings. Available at: https://archaeologistsinresidence.wordpress.com/2014/04/13/collaborative-drawings/ accessed 28/11/16.

Lee, D.H.J., (2016) Map Orkney month: Imagining archaeological mappings. *Livingmaps Review* 1(1):1–25. Available at: www.livingmaps.review/journal/index.php/LMR accessed 28/11/16.

Lee, D.H.J., Thomas, A., (2013) Archaeologists-in-Residence at Papay Gyro Nights: Experience, Expectations and Folklore-in-the-Making. Paper presented at Contemporary and Historical Archaeology in Theory (CHAT) Conference 2013, UCL

London 09/11/13. Available at: https://archaeologistsinresidence.wordpress.com/2013/11/16/archaeologists-in-residence-at-papay-gyro-nights-experience-expectations-and-folklore-in-the-making/ accessed 28/11/16.

Lee, D.H.J., Thomas, A., (2015) Archaeologies in between: Walking (in)visible lines. *Flettverk* 2(SCENE):4–13. Available at: http://tidsskriftet-flettverk.no accessed 28/11/16.

Lee, D.H.J., Thomas, A., (2017) Archaeologists in Residence. Project Blog. Available at: https://archaeologistsinresidence.wordpress.com/ accessed 28/11/16.

Lee, D.H.J., Thomas, A., (in prep) *Archaeologists in Residence: Journeys through Space and Time at Papay Gyro Nights Contemporary Art Festival*. Orkney.

Lefebvre, H., (1991) *The Production of Space*. Blackwell, Oxford.

Lorimer, H., (2005) Cultural geography: The busyness of being 'more-than-representational'. *Progress in Human Geography* 29(1):83–94.

Lucas, G., (2001) *Critical Approaches to Fieldwork: Contemporary and Historical Archaeological Practice*. Routledge, London and New York.

Lucas, G., (2005) *The Archaeology of Time*. Routledge, Oxon.

Massumi, B., (2011) *Semblance and Event: Activist Philosophy and the Occurrent Arts*. The Massachusetts Institute of Technology (MIT) Press, Cambridge, MA and London.

McAtackney, L., (2011) Peace maintenance and political messages: The significance of walls during and after the Northern Irish 'troubles'. *Journal of Social Archaeology* 11(1):77–98.

McAtackney, L., (2013) Sectarianism. In Graves-Brown, P., Harrison, R., Piccini, A. (eds.) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford, pp. 232–246.

Morton, T., (2013) *Hyperobjects: Philosophy and Ecology after the End of the World*. University Minnesota Press, Minneapolis, London.

O'Rourke, K., (2013) *Walking and Mapping: Artists as Cartographers*. Institute of Technology Press, Cambridge, MA.

O'Sullivan, D., (2006) Geographical information science: Critical GIS. *Progress in Human Geography* 30(6):783–791.

Paglen, T., (2008) Experimental Geography: From Cultural Production to the Production of Space. In Thompson, N. (ed.) *Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism*. Melville House, New York, pp. 27–33.

Papay Gyro Nights, (2017) Papay Gyro Nights Contemporary Art Festival Website. Available at: www.papaygyronights.papawestray.org/ accessed 28/11/16.

Pearson, M., (2006) *In Comes I: Performance, Memory and Landscape*. University of Exeter Press, Exeter.

Pearson, M., (2014) *Marking Time: Performance, Archaeology and the City*. University of Exeter Press, Exeter.

Pearson, M., Shanks, M., (2001) *Theatre/Archaeology*. Routledge, London.

Piccini, A., (2009) Guttersnipe: A Micro Road Movie. In Holtorf, C., Piccini, A. (eds.) *Contemporary Archaeologies: Excavating Now*. Peter Lang, Frankfurt, pp. 183–199.

Piccini, A., (2015a) Media-archaeologies (forum). *Journal of Contemporary Archaeology* 2(1):1–147.

Piccini, A., (2015b) Media-archaeologies: An invitation. *Journal of Contemporary Archaeology* 2(1):1–8.

Rathje, W.L., (1979) Modern material studies. *Advances in Archaeological Method and Theory* 2:1–37.

Reid, J.J., Schiffer, M.B., Rathje, W.L., (1975) Behavioural archaeology: Four strategies. *American Anthropologist* 77:864–869.

Reitz, E.J., (2008) *Zooarchaeology*, 2nd Edition. Cambridge University Press, Cambridge.

Reitz, E.J., Shackley, M., (2012) *Environmental Archaeology*. Springer, New York and London.

Remondino, F., Campana, S. (eds.) (2014) *3D Modelling and Recording in Archaeology and Cultural Heritage*. BAR International Series 2598. BAR Publishing, Oxford.

Renfrew, C., (2003) *Figuring It Out: The Parallel Visions of Artists and Archaeologists*. Thames and Hudson, London.

Reynolds, P.J., (1999) The Nature of Experiment in Archaeology. In Harding, A.F. (ed.) *Experiment and Design: Archaeological Studies in Honour of John Coles*. Oxbow, Oxford, pp. 156–162.

Roskams, S., (2001) *Excavation: Cambridge Manuals in Archaeology*. Cambridge University Press, Cambridge.

Russell, I.A., Cochrane, A. (eds.), (2014) *Art and Archaeology: Collaborations, Conversations, Criticisms*. Springer, New York and London.

Schiffer, M.B., (1976) *Behavioural Archaeology*. Academic Press, New York.

Schiffer, M.B., Skibo, J.M., Tamara, C., Boelke, T.C., Neupert, M.A., (1994) New perspectives on experimental archaeology: Surface treatments and thermal response of the clay cooking pot. *American Antiquity* 59(2):197–217.

Shanks, M., (2017) Metamedia at Stanford. Available at: http://humanitieslab.stanford.edu/Metamedia/Home accessed 28/11/16.

Shanks, M., Tilley, C., (1987) *Social Theory and Archaeology*. University of New Mexico Press, Albuquerque.

Simonetti, C., (2013) Between the vertical and the horizontal: Time and space in archaeology. *History of the Human Sciences* 26(1):90–110.

Smithson, R., (1967) Towards the Development of an Air Terminal Site. In Flam, J. (ed.) (1996) *Robert Smithson: The Collective Writings*. University of California Press, Berkley, Los Angeles and London, p. 58.

Thatcher, J., Bergmann, L., Ricker, B., Rose-Redwood, R., O'Sullivan, D., Barnes, T.J., Barnesmoore, L.R., Imaoka, L.B., Burns, R., Cinnamon, J., Dalton, C.M., Davis, C., Dunn, S., Harvey, F., Jung, J., Kersten, E., Knigge, L., Lally, N., Lin, W., Mahmoudi, D., Martin, M., Payne, W., Sheikh, A., Shelton, T., Sheppard, E., Strother, C.W., Tarr, A., Wilson, M.W., Young, J.C., (2016) Revisiting critical GIS. *Environment and Planning A* 48(5):815–824.

Thomas, A., Lee, D., Frederick, U., White, C., (2017) Beyond Art/Archaeology: Research and practice after the 'creative turn'. *Journal of Contemporary Archaeology* 4(2):121–129.

Thomas, J., (1993) The Politics of Vision and the Archaeologies of Landscape. In Bender, B. (ed.) *Landscape: Politics and Perspectives*. Berg, Oxford, pp. 19–48.

Thomas, J., (2004) *Archaeology and Modernity*. Routledge, London.

Thompson, N. (ed.), (2008a) *Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism*. Melville House, New York.

Thompson, N., (2008b) In Two Directions: Geography as Art, Art as Geography. In *Experimental Geography: Radical Approaches to Landscape, Cartography, and Urbanism*. Melville House, New York, pp. 13–25.

Thrift, N., (2008) *Non-Representational Theory*. Routledge, London.

Tilley, C., (1994) *A Phenomenology of Landscape*. Berg, Oxford.

Trigger, B., (1991) *A History of Archaeological Thought*. Cambridge University Press, Cambridge.

Tuan, Y.-F., (1977) *Space and Place: The Perspective of Experience*. University of Minnesota Press, Minneapolis.

Wickstead, H., (2008) Drawing Archaeology. In Duff, L., Sawdon, P. (eds.) *Drawing: The Purpose*. Intellect Books, Bristol, pp. 13–27.

Wickstead, H., (2013) Between the Lines: Drawing Archaeology. In Graves-Brown, P., Harrison, R., Piccini, A. (eds.) *The Oxford Handbook of the Archaeology of the Contemporary World*. Oxford University Press, Oxford, pp. 549–564.

Wilson, L.K., (2009) Notes on a Record of Fear: On the Threshold of the Audible. In Holtorf, C., Piccini, A. (eds.) *Contemporary Archaeologies: Excavating Now*. Peter Lang, Frankfurt, pp. 113–128.

Withers, C.W.J., (2000) Authorizing landscape: 'Authority', naming and the Ordnance Survey's mapping of the Scottish Highlands in the nineteenth century. *Journal of Historical Geography* 26(4):532–554.

Wood, D., (2010) *Rethinking the Power of Maps*. The Guilford Press, New York.

Wylie, J., (2005) *Landscape*. Routledge, Oxford.

8 Here be worms

Map art for the archaeologist (or how I learned to stop worrying and love artistic abstraction in maps)

Andrew Valdez-Tullett

All things that exist, exist within space. Whether it is a physical object, a social practice, an idea, power or even knowledge, it will always have a spatial element (Foucault 1984, 252) and, hence, locational relativity with other things. Maps are a principal media used to display locational relativity and are an important tool for the conversion of personal ideas into transferable knowledge and their transmission to an audience (Robinson and Petchenik 1976). Within the Western world, the accuracy of a map, based within a formal scientific methodology, provides the map with an unquestionable, objective authority but like any means of transmitting knowledge they can only be successful devices if the information is transmitted to the target audience correctly (Coulson 1977). Within academia and archaeology, we are obsessed with degrees of accuracy and producing rigidly scientific maps that reproduce the world and our ideas writ small. They socially produce and control knowledge, constructing or maintaining dominant views of the world, that appropriate one perspective at the exclusion of all others (Smith 1998).

Rigidly 'accurate' scientific maps may be appropriate for some audiences within the archaeological community, but can be difficult for audiences, such as the general public, to decipher. Whilst this makes the veracity of some maps hard to question, they fail to fulfil their basic purpose, that of transmitting information. Isolating this information from audiences like the public, restricts their ability to participate in the debate, closes off the discipline, and raises questions of academic elitism and the wider role of archaeology within society. They can lead to disenfranchisement and misrepresentation, and like any socially constructed message are open to misreading, misinterpretation and misappropriation. Maps are fundamentally a form of hermeneutic device and as such are tied up within wider debates of relativism, subjectivism and objectivism (Zimmerman 2015).

This chapter suggests that to create better maps, archaeologists must select the most appropriate format for the transmission of their information based upon their audience. It explores the theoretical background to the role of maps in transmitting knowledge and how they create space or new versions of reality, but are experienced as abstractions. It questions whether scientific maps, based upon objective criteria, are always the most appropriate format for archaeologists to express their ideas and information. It questions if maps are ever 'accurate' and asks what it is we are actually producing when we create a map. It posits an alternate range of mapping techniques based upon art rather than science that opens interpretation to different audiences and highlights an inherent struggle with the perception that non-scientific mapping techniques are not considered useful in academia and, therefore, of a lower standard or value than 'objective' scientific maps.

The mapping process

> Separated from his product, man himself produces all the details of his world. The more his life is now his product, the more he is separated from his life.
> (Debord 1983, 33)

Within the modern Western world, a formal mapping discipline has grown with strict adherence to prescribed scientific principles. These are founded on the idea that spatial precision infers accuracy and, in turn, implies veracity, whilst plotting exact spatial relationships makes the map a neutral unbiased mechanism for expressing certain factual pieces of information (MacEachren 1995, 337). Its grounding within science has aimed to remove subjectivity and promote objectivity to imply that a cartographic truth exists, what Harley argues is an 'epistemological myth' (1989, 15). It reflects a basic misunderstanding of what a map is. Maps act as a hermeneutic device, that is as a device for transferring understanding (Guiraud 1975, 41). The cartographer wishes to create understanding and the viewer wishes to understand. In between, sits the map. But as with all acts of understanding, the perception of the message being portrayed within such a device is a matter of interpretation situated within a socio-cultural context (Wood 1992). To create better maps we need to understand the mapping process from creation to understanding.

The map is created as the representation of an idea, concept or version of reality that an audience (percipient) may draw upon for information (MacEachren 1995, 12). The cartographer takes the idea that they wish to represent and encodes it onto a map using abstract symbology and devices (Bertin 1983). Remote and detached from the cartographer, the percipient decodes the symbology and interprets the map to (hopefully) gain an understanding of the cartographer's representation of reality. The representation interpreted by the percipient will never be identical to that intended by the cartographer. Contributing to this are indirect emitting and indirect perceiving errors, concepts adopted from communications theory (Ratajski 1973). These were later labelled as 'noise' by Robinson and Petchenik (1975), and are things that mask, hide, distract or distort a message from its inception through to its interpretation; perhaps most clearly at play during the game of Chinese Whispers. An underlying source of noise in the communications process is a mismatch in the personal biographies of cartographer and percipients that lead to diverse interpretations of the understanding contained within the map. People understand the world around them through reference to their personal biographies. That is, they interpret the world against the backdrop of their cultural, historical and social background and their experience, gained from a history of practice and reflexive learning (Bourdieu 1977). This highly individualistic appreciation of the world around each of us means that we all hold unique world views and perceptions of reality. The cartographer and percipients thus have different frames of reference as to how they understand and interpret the world around them and things within it, such as maps (Harley 1989; Wood 1992). This mismatch in frames of reference can lead to misinterpretation of the map, a failure to understand some elements, or even cause the percipient to draw unintended meanings from the representation. Although the biographical frames of reference are different for each individual, it is reasonable for there to be some overlap, if not an exact match, which allows an understanding to be reached between the two parties even if the ultimate interpretation varies. As archaeologists, we share biographical overlaps in the years spent studying the discipline that grounds us within a theoretical framework within the discipline. We have been exposed to examples of scientific maps and even produced our own. Our biographies mean that we, as archaeologists, are usually quite good at interpreting the maps of other archaeologists. Without a biography that situates a percipient within this framework, the potential for misreading of an archaeological map is much higher. Where audiences do not share our academic frames of reference, either when we target these groups or when maps produced for academic consumption are recirculated outside of academia, there exists significant potential for the representations in those maps to be misunderstood.

Noise first enters the system with the cartographer's decision as to the version of reality or message that they wish to convey, based upon the evidence or data that they have. Once a perception has been formed, this is the message that will be conveyed, thereby negating all other possible perceptions which the cartographer denies to the percipients (Wood 1993, 18). This is usually a highly selective process and only certain types of information will be given, creating a sanitized and simplified version of reality that is often mixed with more-theoretical elements presented as fact. Clearing away the less-important elements of reality is done to reduce the noise to the viewers. It removes data that is not considered important to the transmission of the message and that might distract during interpretation but consequentially reduces the reality of the portrayal, increasing the abstraction and subjectivity of the map. This cartographic censorship 'marks the boundaries of permissible discourse and discourages the clarification of social alternatives' (Harley 1988, 288).

Next is the encoding process, where various spatial elements are translated into a cartographic language. This includes both the form of map to be used and the symbology. For successful communication of the message, the

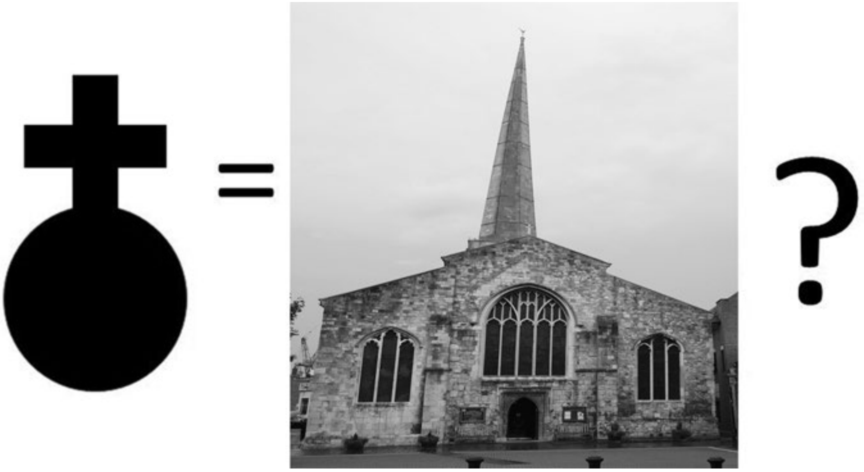


Figure 8.1 Whilst the map symbol of a cross on a black circle is commonly understood to represent a church with a spire on UK Ordnance Survey maps, it actually represents ‘a current or former place of worship with a spire, minaret or dome’ (image created by the author).

cartographic language employed must effectively present the data in a clear and meaningful way. Secondly, it must take into account the language fluencies of the percipients. It is an important point to note that the meaning of a symbol is never innate and always open to interpretation. The symbol (or signifier) is subjective rather than objective. As with any language, they are not linked to reality even though they are accepted as such, thereby providing another source of noise to enter the communication process (Rapoport 1952). For example, there is nothing integral to the use of a circle topped by a cross that would suggest any particular meaning (Figure 8.1). For those brought up in the tradition of using Ordnance Survey maps in the UK, we might instantly interpret it as a church with a spire, but this is not the instant conclusion reached by those from alternative mapping cultures or indeed cultures that do not have churches with spires. More importantly, growing up with a certain style of symbology can confuse as the meanings of symbols shift. In today’s multicultural Britain, the circle and cross symbol now represents ‘a current or former place of worship with a spire, minaret or dome’ (Ordnance Survey 2017) and so may just as likely represent a mosque, temple or synagogue as a church.

Interpretation of the map symbology by the percipient is dependent upon two factors: their ability of recollection and ability of imagination (Ratajski 1973). The percipient’s ability to interpret the map therefore depends upon whether they have encountered a certain map format, style and symbology before. If so, can they recall what this coding means? If they cannot recall the meanings or have not been faced with such a system, can they fill in the gaps based upon their background knowledge? Lastly, this abstract information is interpreted and imagined back into a perceived version of reality.

Maps as a production of space

> All the time and space of his world become foreign to him with the accumulation of his alienated products. The spectacle is the map of this new world, a map which exactly covers its territory. The very powers which escaped us show themselves to us in all their force.
>
> (Debord 1983, 31)

In *The Production of Space*, Henri Lefebvre (1991) explores how social space was brought into being through a conceptual dialectical triad of spatial creation: spatial practice, representations of space and representational spaces (or spaces of representation).'Spatial practice' is the material brought into being through social activity. It is a space created and shaped by everyday life and the patterns of repeated interaction tied up within the process of production and reproduction. It is the daily and routine encountered spatially through practice. 'Representations of space' is the space as designed, a space of language, knowledge, signs and codes through which the relations of production are supported and reproduced. It includes space created by maps, plans, information in pictures, and signs. It is space portrayed in geographic information systems (GIS). It is space measured, quantified and plotted. It is the realm of town planners, architects, scientists and social scientists and, we might add, archaeologists. 'Most crucially these representations are central to forms of knowledge and claims of truth made in the social sciences, which (today) in turn ground the rational/professional power structure of the capitalist state' (Shields 1999, 164). 'Representational spaces' (or spaces of representation) reflects the inversion of 'representations of space'. This is a largely symbolic dimension of space. It is space as created through reaction, resistance and reappropriation. It is the space of graffiti, the hole in the fence and desire lines of people that cross the grass rather than follow the pavement. It is the space of art, the underdog, inhabitants and users.

It is perhaps pertinent here to take a little time to discuss how, as Lefebvre states, maps bring space into being. It is a common misperception that maps represent space (not helped, incidentally, by the way Lefebvre himself labels the space they produce). This is an implicitly objectivist stance whereby a map is a neutral reflection of the world and real and existing spatial relationships within it. Such an implication carries the connotation that maps are factual and scientific reproductions of the world and hence irrefutable and unquestionable, something that provides them with most of their power (Wood 1993, 18).

The belief that accuracy and adherence to strict scientific principles locks maps into a closed system that makes the device objective and true is, however, unrealistically objectivist (Keates 1996, 121). Maps do not include all the information contained within the real world. People do not experience or perceive of multidimensional landscapes in two-dimensional map form, but through a range of complex meanings referenced to personal biographies (Tilley 1994, 19) and relative, not quantitative (Klippel et al. 2011; Kraak 2008; Rogerson 2001; Thomas and Cook 2005). The implications are two-fold. Spatial relationships as experienced by the individual are hard, if not impossible, to reflect in map form (Lefebvre 1991, 85–86). The inability of people to view the world quantitatively has led to the development of media interfaces e.g. maps, global positioning system (GPS) units, GIS etc. which allow them to access this mathematical dimension to space. Many elements of the real world are excluded during the cartographic process, and hence are absent from the percipient's inferred view of reality. Likewise, the interpretation of how an object should be classified will vary by cartographer. One person's large post-hole is another's small pit. Once interpreted and reproduced in map form this classification attains a new higher level of reality. This process of generalization and simplification and the translation of real life into cartographic language mean that the map is experienced as an abstraction of the world, an analogy, rather than a representation of the reality itself (Robinson and Petchenik 1976, 5). When we attach quantitative values and positions to objects, we are 'not expressing a simple datum of sensation but are situating the sensory data in a relationship and system, which proves ultimately to be nothing other than a relationship of pure judgement' (Cassirer 1955, 30). The cartographer is, therefore, producing space in their map creation. They are effectively bringing a new reality into being, that although it is derived from the cartographer's socially constructed subject centred view of the world, is presented as the decentred, neutral, actual reality of the landscape.

Objects never appear as neutral things without association, but are always endowed with a body of meanings that are open to interpretation (Husserl 2012 [1913]). The idea that the map is an objective document that can be equally understood by all disengaged spectators is a fallacy. Their interpretation is deeply embedded within a culturally and historically constituted present with a set audience. Variations of these factors, such as changing the audience, the cultural background of the viewer or viewing the map at some date in the future, will invariably alter how the map is viewed, understood and used. Repressing the knowledge that such influence exists within the production of such documents for the sake of some objective truth is misleading. The more scientific we make our maps in the name of objectifying them, the more we restrict their interpretation to a specific set of audience biographical values. The result is that such zealous attempts to objectify ironically end up entrapping our devices within subjectivism (Zimmermann 2015, 13).

However scientific we make maps, they will never be objective documents, and by necessity will always be linked subjectively to the biographies of those that create and read them. Such scientifically produced maps may allow us to transfer information within our academic peer group but they may not be so suited for external audiences. Most archaeologists may not deem this a problem, as by publishing their work within an academic journal they may feel that it is acceptable to believe that their audience will have at least a basic understanding of archaeological theory and a background to the ideas being represented. Once published, however, a map leaves our control and is open to re-appropriation. This may be the re-publication of maps in popularist work where the audience will have less grasp of archaeological theory or the ability to decode the complex ideas contained within the map, taking such works as factual rather than theoretical. More nefarious and politically charged is the appropriation of certain distribution maps to push nationalist agendas (Arnold 1996, 553; Reinerth 1940; Sklenář 1983, 161; Veit 1989, 39), pseudo-archaeologists supporting tenuous arguments or pushing religious agendas (Silberman 1998, 180; Vogel 1993)) or disenfranchised elements attempting to regain control of a national heritage (Smith 1998, 80). Re-appropriation of published work remains a problem yet to be solved (Keates 1996, 148), and whilst we may think that we realise who our audience is, we must understand that our images can be reproduced outside of our control to new audiences without their original context. We need to understand that there is a certain ambiguity in the audience of our maps, even if we believe that we have a clear target. Once we understand this ambiguity we need to make a judgement as to the style, content and ideas that we represent through our maps and whether the benefits of communicating our ideas effectively to a tightly defined audience of peers outweigh the risks of re-appropriation and misrepresentation.

The ability to explain, sometimes complex, archaeological theories to other non-academic audiences though, may be found in a reassessment of the mapping techniques that we employ. For Heidegger (1996 [1927]), the meaning of something emerges not from a disconnected methodical investigation but through connecting with it in a meaningful life context. For many, this may be to move the work we produce from Lefebvre's scientific 'representations of space' that reinforce existing knowledge structures to his more artistic 'spaces of representation' that hold deeper significance to more marginal groups.

Map art

> . . . the way we perceive the world as meaningful is closer to our experience of art than to a science experiment.
>
> (Zimmermann 2015, 8)

Some cartographers have highlighted the subjectivity and rhetorical nature inherent within maps (Harley 1988, 1989; Wood and Fels 1986; Wood 1992) to discuss the intrinsic dangers of viewing mapping as an objective process that can be assessed through 'the objective, positivist, reductionistic approach of physical science' (MacEachren 1995, 10). The creation of maps, they argue, 'is more akin to literature than astronomy or geophysics' (MacEachren 1995, 10), and so it would be more appropriate to model methods of cartographic analysis on literary criticism than the scientific method. However, it is not helpful if one restrictive set of theories or methods are replaced by another and the richest course open to us is to explore how the scientific and artistic disciplines can be combined to produce better overall results. When discussing art in the mapping process, it is not just the semiology of graphics (Bertin 1983), the application of colour, weight of lines, and the use of decoration or decorative elements that are used for the look and feel of a map. Instead, it has a broader reach that includes the aesthetics of a production, prompts and understands emotional responses, and embraces subjective representations and knowledge (MacEachren 1995, 18).

When a percipient reads a map, there comes a point when they are required to suspend their disbelief and transfer the information they see in abstract cartographic language to a perception of the reality that the map analogy alludes to. That is, those banal black dots on a plain white background represent prehistoric settlement within a populated, cultivated and socially meaningfully landscape. This suspension of disbelief is something inherent in art, where the audience is asked to suspend their disbelief that a range of pigments on a canvas is truly the wife of a sixteenth-century merchant or that the well-known actor speaking with a heavy Scottish accent is really a Soviet submarine commander. As art widely facilitates this suspension of disbelief, there is no reason why such traditions cannot be called upon to aid an audience in their interpretation of maps.

There are multiple ways and means of producing maps influenced by a more artistic tradition, and these may be loosely termed 'Map Art'. Map Art forces us to question whom we are communicating with and the message we wish to communicate. It challenges us to find imaginative and innovative ways of engaging with this audience, creating methods of structuring/deconstructing, unifying/dividing, forming/deforming, linking/ breaking out from the information within the stories we wish to tell. Map Art is a means of engaging with more people and transmitting your message successfully and it is a means of moving cartography firmly into Lefebvre's category of 'Representational space'. Although challenging, it is also fun and rewarding, employing a range of techniques that can vary with the expertise of the creator.

Map Art is not formally disciplined, exact or quantitative, but rather chaotic, artistic and qualitative. It cannot, nor should it, be codified in any strict sense but should be open to experimentation and play. Although Cartesian co-ordinate systems may be employed, it is more common to use a vaguer, less-exact, way of locating things, places, ideas and emotions spatially. Indeed, locational spatiality is usually represented in relativistic terms rather than in absolutes. Its proponents employ a creative use of materials. 'Map elements can be found everywhere; in seashells, crumpled wax paper, the folds of plastic wrap, and ink running down the page. String reminds us of the longitude and latitude lines and stencils suggest houses and the roads between them' (Berry and McNeilly 2014, 30). Likewise, the symbols and imagery that are frequently utilized are typically more representational and geared towards creating emotional responses than a strict cartographic language of the initiated. Neither does the map form follow any strict standard. Amongst the many maps that Berry and McNeilly (2014) explore are cut-out maps, map puzzles, mosaic maps, word maps, maps of origins and story maps.

What are presented here are, therefore, ideas to stimulate rather than rules, boundaries or sub-disciplines. A range of non-academic publications on Map Art exist whose aim is to stimulate your ideas rather than formulate a subject (for instance, Berry 2011; Berry and McNeilly 2014; Harmon and Clemans 2009), but what follows are some possible avenues for archaeologists to explore.

Informal mapping symbology

For the cartographer to successfully portray their ideas they need to choose a set of symbology for their data. The symbols and concepts used in this cartographic language are merely signifiers of reality, and none are self-explanatory (Wood 1993, 98). Tailoring your map imagery and symbology to your audience is, therefore, highly important in minimizing the introduction of noise to the system and allowing the successful interpretation of your map. For the general public, it may be better to use an informal, more-representational style to aid interpretation. In general, a representational style of symbology reduces the interpretative leap required from symbol to the objects they represent and, with it, less chance for misinterpretation.

In many ways, this is a cry to regress mapping to an earlier age when the representational style was unquestioned. Maps such as the Hereford Mappe Mundi or the Carta Marina made widespread use of symbolism and imagery. John Speed's maps of England's seventeenth-century towns are not the bland reproduction of streets found on today's Ordnance Survey maps. His map of Leicester allows percipients to instantly grasp a feeling of the 1610 town, while more modern maps require a greater deal of inspection before an impression is reached (Figure 8.2).

This tactic has been deployed within archaeology before. Take the plan of the unfinished hillfort at Ladle Hill produced by Piggott (1931), which advises that it is not a completely accurate or exact survey, but it is undoubtedly one that allows a superior consciousness of its landscape setting than does the modern Ordnance Survey map (Figure 8.3). It generates an image in the mind of sheep gambolling on the downs with sky larks flying overhead; it has life to it not found in the sterile scientific OS map.

Likewise, the need to produce maps that do demand absolute accuracy such as plans or section drawings of excavations does not preclude the use

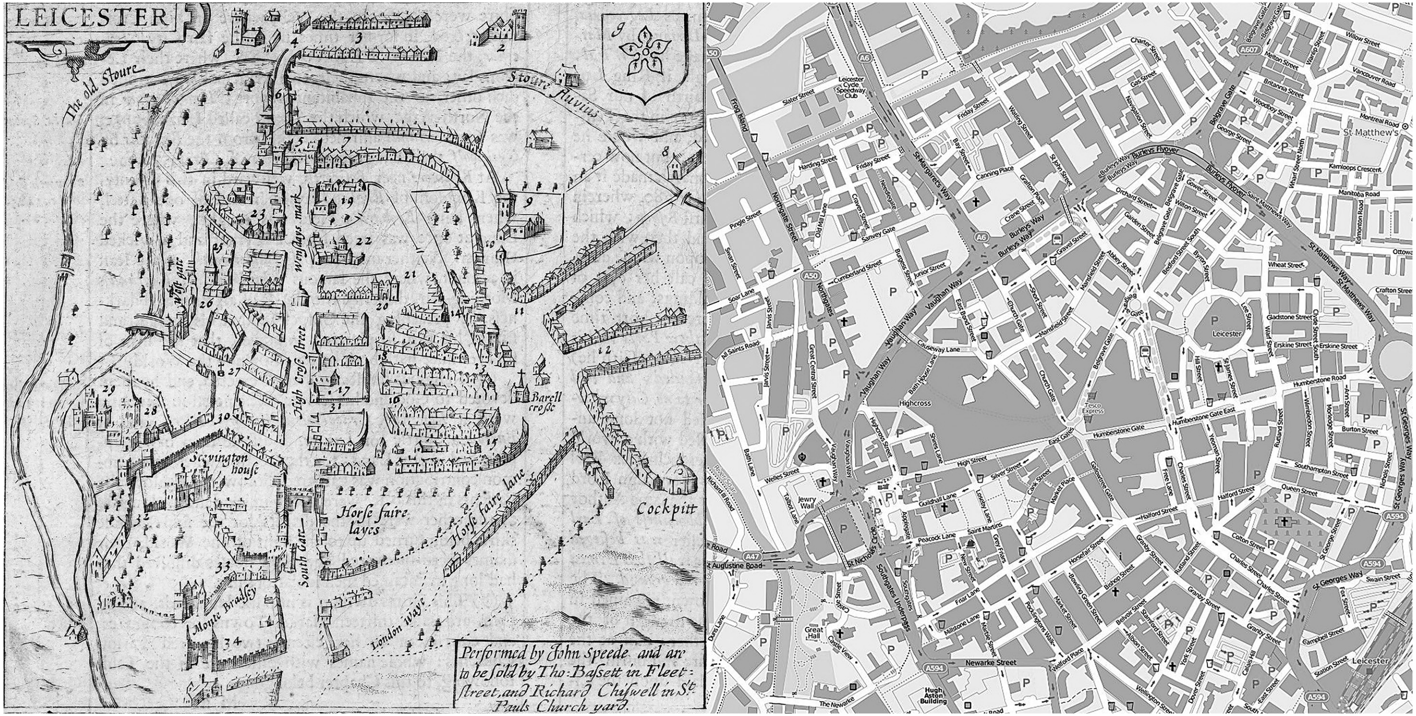

LEICESTER
The old Stoure
Stoure fluvius
Wensdays mark
High Cross street
Barell crosse
Scevington house
Horse faire layes
Horse faire lane
South Gate
Monte Bradssy
London way
Cockpitt
Performed by John Speede and are to be sold by Tho: Bassett in Fleet-street, and Richard Chiswell in St. Pauls Church yard.
St Matthew's
Burleys Flyover
St Margaret's Way
Vaughan Way
Highcross
Humberstone Gate
Belgrave Gate
Leicester
St Georges Way
Southgates Underpass
Great Hall
Hugh Aston Building
Newarke Street
Jewry Wall

Figure 8.2 Comparison of the 1610 John Speed map of Leicester and an extract from a modern map (image created by the author).

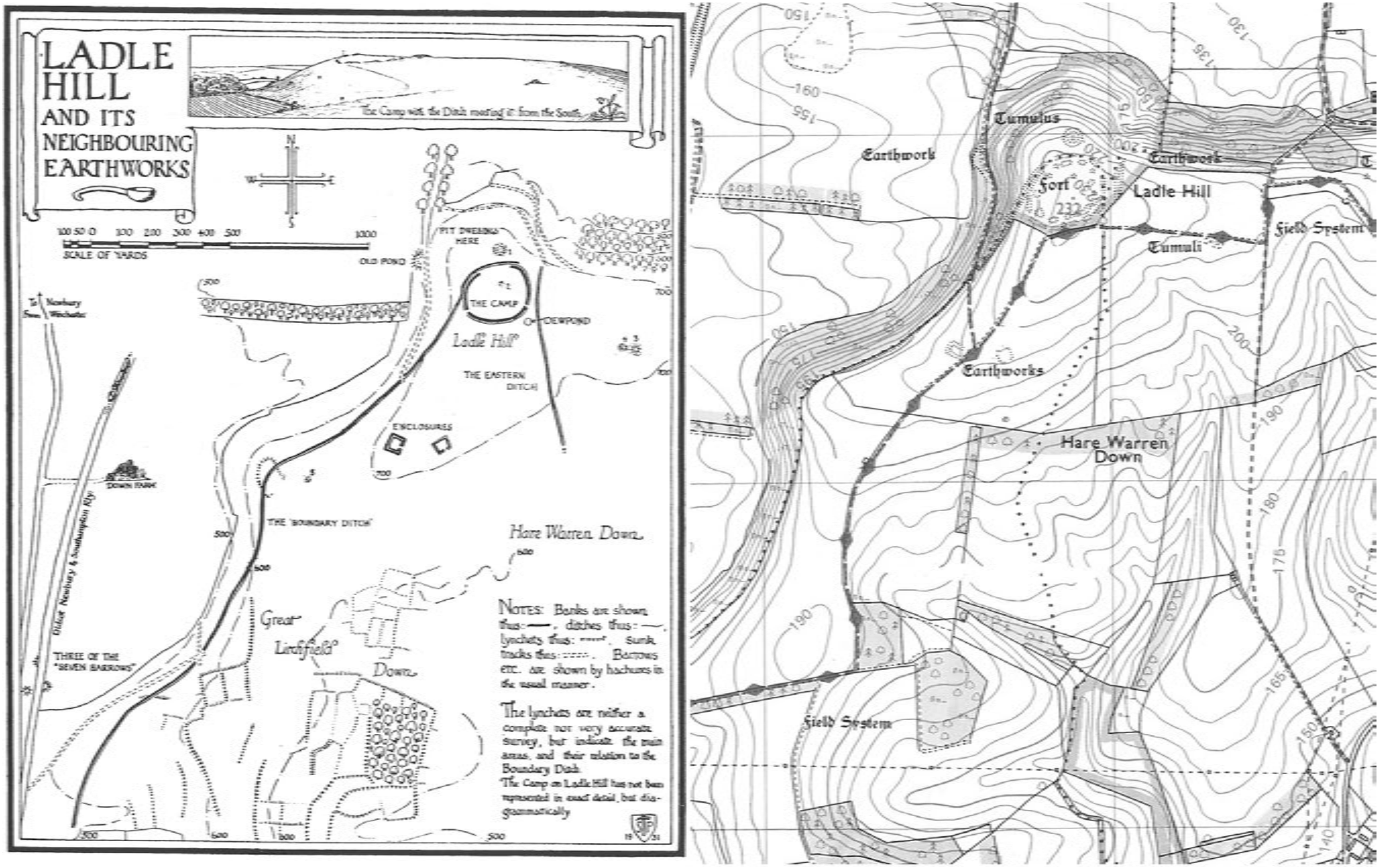

LADLE HILL AND ITS NEIGHBOURING EARTHWORKS
The Camp with the Ditch meeting it from the South
N
W
E
S
SCALE OF YARDS
100 50 0 100 200 300 400 500 1000
PIT DWELLING HERE
OLD POND
THE CAMP
DEWPOND
Ladle Hill
THE EASTERN DITCH
ENCLOSURES
THE 'BOUNDARY DITCH'
DOWN FARM
Didcot Newbury & Southampton Rly
THREE OF THE "SEVEN BARROWS"
To Newbury
Hare Warren Down
Great Litchfield Down
Notes: Banks are shown thus: —, ditches thus: —, lynchets thus: ----. Sunk tracks thus: -----. Barrows etc. are shown by hachures in the usual manner.
The lynchets are neither a complete nor very accurate survey, but indicate the main areas, and their relation to the Boundary Ditch.
The Camp on Ladle Hill has not been represented in exact detail, but diagrammatically
19 31
Tumulus
Earthwork
Fort
232
Ladle Hill
Tumuli
Field System
Earthworks
Hare Warren Down
Field System
130
135
150
155
160
175
190
200
180
165
140

Figure 8.3 Comparison of the Piggott (1931) map of the unfinished hillfort of Ladle Hill, UK with an extract from the modern Ordnance Survey map (image created by the author).

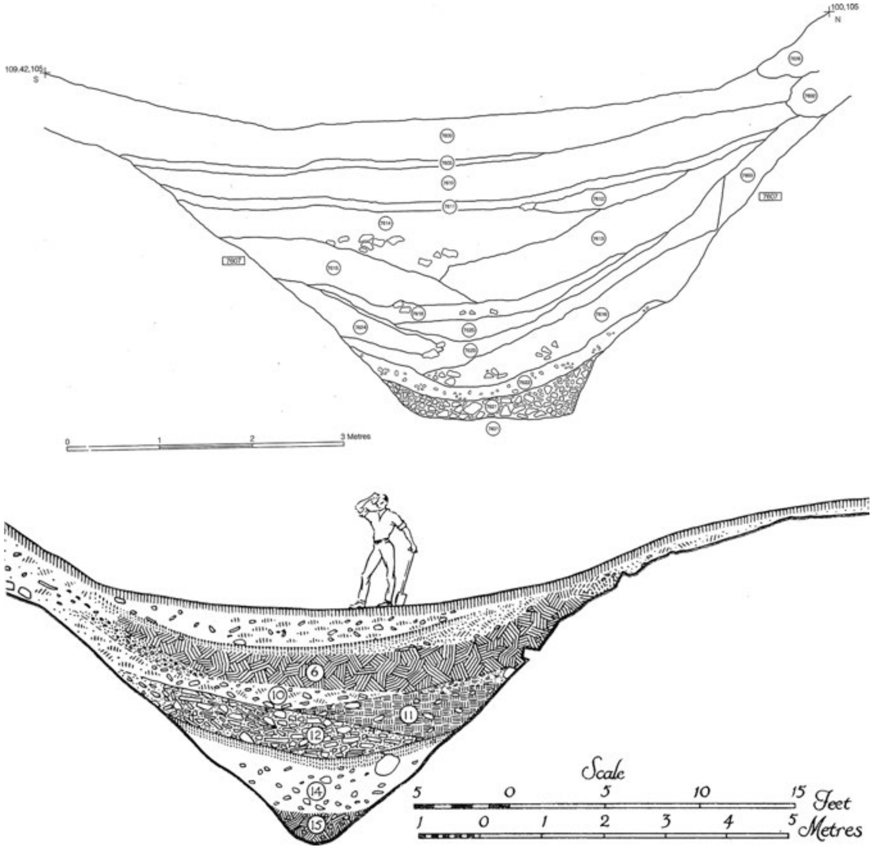


Figure 8.4 Comparison of ditch sections through the UK hillforts of Segsbury (Lock et al. 2005) and Stanwick (Wheeler 1954) illustrating how the inclusion of an object of known size instantly changes our appreciation of scale (image created by the author).

of alternative symbology. Figure 8.4 illustrates two sections through hillfort ditches. Whilst the upper section through the Segsbury ditch (Lock et al. 2005) includes a scale, visualization of what this would look like in reality is not immediate. In contrast, the inclusion of something we tacitly understand the size of (in this case, an archaeologist) in the lower section from Mortimer Wheeler's Stanwick excavation report (1954) instantly allows us to visualize the dimensions portrayed.

The representational style of maps and symbology is open to criticism, as it is deemed to include interpretation and, hence, subjectivity rather than cold neutral objectivity, but as explored above, maps implicitly contain interpretation and are, hence, fundamentally subjective. Similarly, as we are expressly trying to help the percipients visualize our views through our maps, we should not be apologists for achieving our goals.

Materials in the map

The world around us is not a nondescript two-dimensional plain; it is filled with things and beings and we locate ourselves spatially through our relationships with these. As archaeologists, we recover a great deal of material from our interventions and the study of this, whether artefacts, zoo-archaeological or archaeo-botanical remains, forms an integral and highly important aspect of our discipline. Many of the maps we produce are created to spatially locate this material and explore its distributions. Such material is, therefore, an obviously under-utilized resource in the production of the map itself.

Using objects in the mapping process allows the percipient to negotiate spatial relationships through these objects – a mapping less *of* objects than *with* them. The use of archaeological materials in the production of alternative spatial tools employs this factor, confronting the percipient with the message in a solid form. Ensuring the integrity of the recovered material is paramount, but this does not preclude its use. One case where such a technique could be used, for example, would be a communal archaeology project in a village where each household excavates a $1m^2$ test pit. The pottery recovered by each household would be used to plot its distribution throughout the village. It could show the total pottery recovered (Figure 8.5) or broken

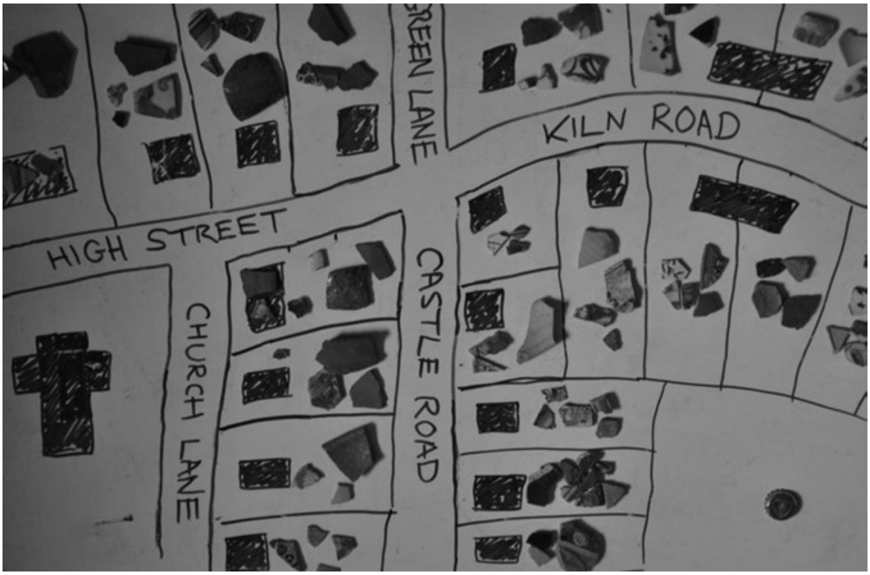


Figure 8.5 The hypothetical use of pottery to create a distribution map (image created by the author).

down into a series of images where pottery is divided chronologically to create a visual representation of the shifting pattern of occupation in an area.

Artefacts are an integral part of the archaeological experience and their use provides an alternative and more-tangible means of engaging with the audience. As a technique it is especially useful in projects that involve members of the public from a range of backgrounds and ages and may appeal to those that are more tactile orientated.

Movement maps

For journeys where you follow a certain path it is often unimportant what lies to your left or your right. What is important is what you will encounter next and so on until you reach your destination. Recording the route of a journey, you find yourself plotting a series of wayfaring points that we navigate between and what will, if we follow correctly, get us to our ultimate destination. The monotonous motorway journey does not need to be charted mile by mile, just that you join at junction 5 and leave at junction 21. The junctions and service stations in between are largely academic on the map, and for the journey they merely allow you to count down until your exit.

These kinds of maps are usually termed *topological maps* as, whilst they retain the essential relationship between points, other information such as scale, distance and bearing are removed or distorted. One of the most famous of these topological journey maps is the London tube map. When you board a train at Tower Hill and alight at Liverpool Street, the geography between the two stations disappears to be replaced by a single place, that of the tube train. The streets that lie between the two stations are unimportant in this journey, as is the route actually taken by the train itself. The tube system effectively collapses space and time for the traveler, with London being reduced to the geography immediately around each station. For the map, however, a basic string of Tower Hill, Aldgate, and Liverpool Street plus the colour of the connecting tube line is all that is needed (Figure 8.6).

These are not necessarily new devices; archaeologically, we have topological maps such as the Tabula Peutingeriana which maps itineraries for journeys across the Roman Empire. Artistically, the work of Richard Long has at various times focused on mapping movement within the landscape. His work ‘A Line Made By Walking,’ England 1967, shows a line made on grass by repetitively walking back and forth. It is a visual map of the repeated journey he made between two locations recorded through photographic media. In his ‘A Ten Mile Walk’, England 1968, the artist followed the exact path, without deviation, of a ten-mile straight line that he drew across a map of Exmoor. It is a route that took him across areas of rough terrain and forced him to cross numerous boundaries, streams and other obstacles, challenging the ability to walk in a straight line artificially enforced upon the landscape. ‘It is surely not just a coincidence that the line of the walk as it is drawn on Long’s map passes through the exact centre of the X of Exmoor as it was

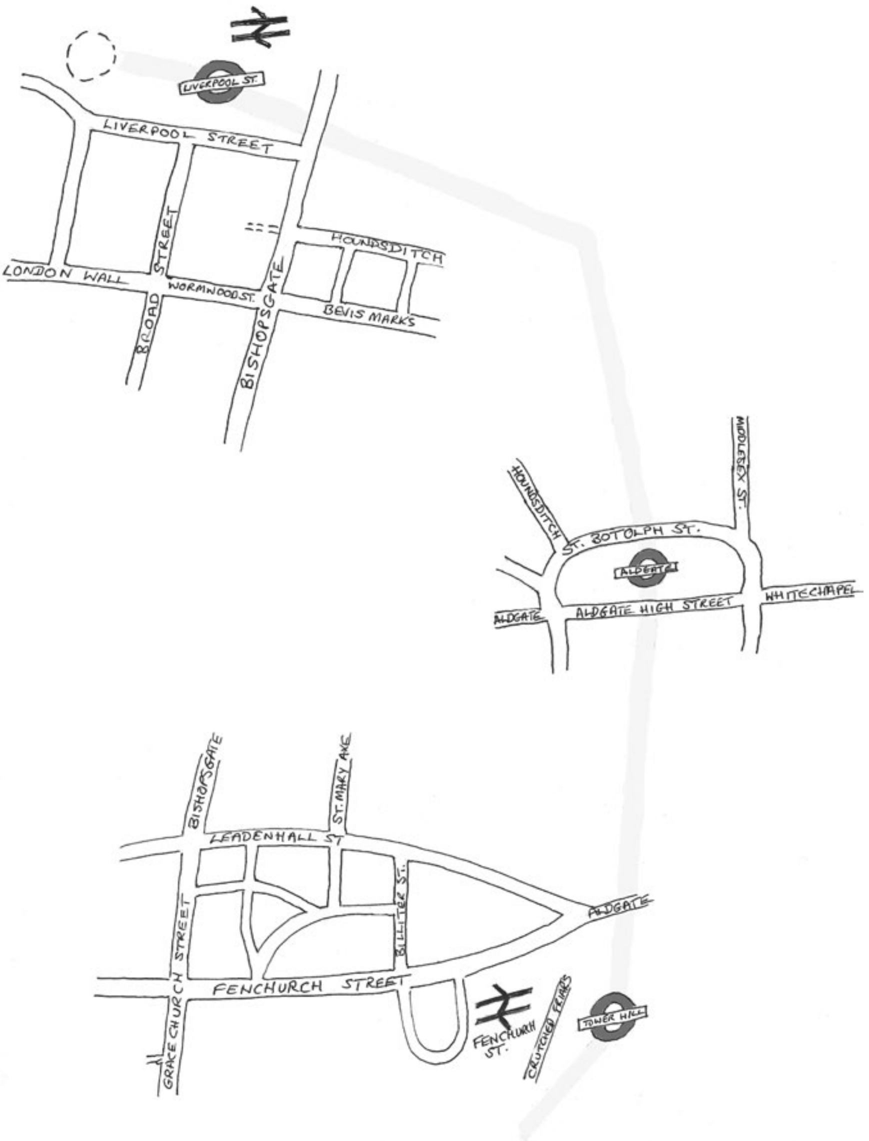

LIVERPOOL ST.
LIVERPOOL STREET
BROAD STREET
LONDON WALL
WORMWOOD ST.
BISHOPSGATE
HOUNDSDITCH
BEVIS MARKS
HOUNDSDITCH
MIDDLESEX ST.
ST. BOTOLPH ST.
ALDGATE
ALDGATE
ALDGATE HIGH STREET
WHITECHAPEL
BISHOPSGATE
ST. MARY AXE
LEADENHALL ST
BILLITER ST.
ALDGATE
GRACECHURCH STREET
FENCHURCH STREET
FENCHURCH ST.
CRUTCHED FRIARS
TOWER HILL

Figure 8.6 The Circle tube line in London. When travel is mainly conducted by tube, our mental recollection of the streets of London becomes reduced to a series of islands around tube stations. Space is effectively collapsed (image created by the author).

printed on the sheet. Of course, this X only exists on the map and not on the ground: X marks a spot where there is nothing special to see' (Alfrey 2012). The line formed by the journey was documented on an Ordnance Survey map but otherwise formed 'a ten mile invisible sculpture' (Alfrey 2012). It is an illustration of how art can subvert Cartesian maps.

For archaeologists, such map types offer great potential for charting the movement of people, animals, things or ideas such as pilgrimages, processions, seasonal migration, diaspora or trade. Likewise, they can be used for heritage to map people's movement around monuments or even to locate sites. For example, many rock outcrops containing rock art in the British Isles are overgrown and extremely hard to locate. Any rock art researcher, even with a GPS device and the grid reference, will know the trials and tribulations of trying to locate a specific rock outcrop. Inscribed rocks may be flush with the ground and largely covered by turf or vegetation. Alternatively, they could be a small slab hidden in a field of rocks. A 10 m error when initially recording the rock's location combined with these factors can be the difference between a five-minute and an hour-long search. Similarly, blindly following a GPS device has its own inherent dangers, including impassable barbwire fences or shear drops. A series of images charting the path to an outcrop allows a user to see the route they must follow and have their attention drawn to such features as specific warnings, parking advice, stiles or stepping stones (Figure 8.7). Like the tube map, this mapping process collapses space into a series of wayfaring points, editing out the space in between to clear the chaff and reduce the noise by reducing the information to that which is pertinent to the message. Combining such maps with additional information, such as OS excerpts, grid references and images of the rocks could prove invaluable in locating some sites for visitors and researchers.

Map games

Map games are self-descriptive and something many of us will have come across without consciously making the association that it is a form of map. Rather, our minds will have tended to have focused on the game aspect of these maps. It is a relatively simple process to reverse engineer and turn our maps into games (Berry and McNeil 2014, 94). The nature of these devices means that they are particularly useful for passing on information to groups with little formal training in map reading who may find our normal maps hard to decode. Rather than being a passive document, the map game demands the active engagement of those playing the game. Players are forced to interact with the map. In order to play, they must read it and because they want to play they will read it.

The Danebury Environs programme and the Danebury Roman Environs programme investigated the landscape, and specific sites within that landscape, around the hillfort of Danebury, Hampshire, UK, to contextualize the site and consider questions of continuity and change through Prehistory and

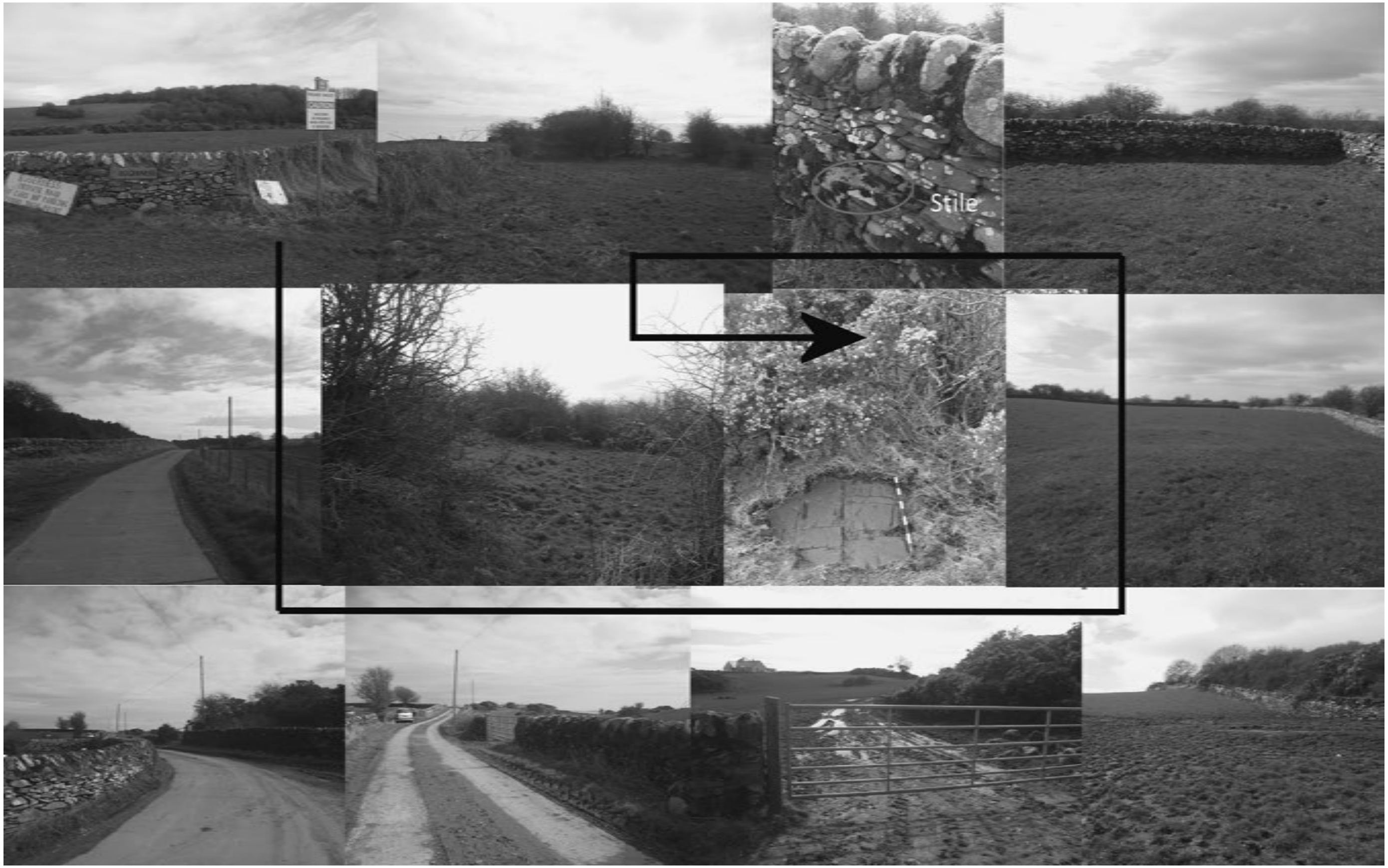


Figure 8.7 Movement Map illustrating the route to a rock art panel in the Eggerness area of The Machars peninsular, Scotland. Note how details of interest can be picked out including, warning signs and the location of an otherwise invisible stone step in a dry stone wall (image created by the author).

the Roman era (Cunliffe 2008). Maps for this project locate the sites and illustrate some of the larger earthworks and topographical features that were considered pertinent. Although perfectly acceptable, these maps contain little intrinsic information beyond the spatial relationships of the features and they are meant to be read in conjunction with the publication within which they are included.

Figure 8.8 is a map game created by this author on the same subject. The first thing to note is that it uses representative imagery rather than the abstract symbology of most maps. This makes it easier for the percipient to decode the map. This is obviously the author's interpretation of what the sites would have looked like rather than a neutral, 'objective' view of the evidence (Figure 8.9), but it leaves the reader in no doubt as to what their interpretation is and little room for them to misinterpret the map. Unlike most deserted, vacant maps, this one is populated with people and animals, in, around and between sites. Like the landscape, it is teeming with life. To play this game, you must actively engage by following a route around the map. Some squares include information and instructions that are tied into the message that the author wishes to communicate through the map (Figure 8.10), so instead of purely spatial or relational information you are also able to represent processes, activities, events and beliefs. It effectively writes people back into the map.

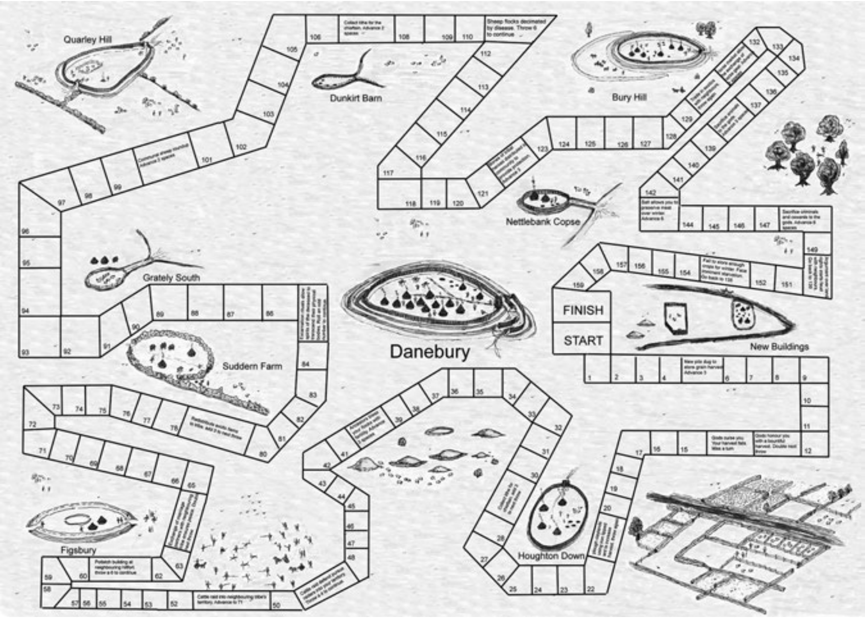


Figure 8.8 Danebury Environs – The Game (Map). Example of a Map Game created by the author.

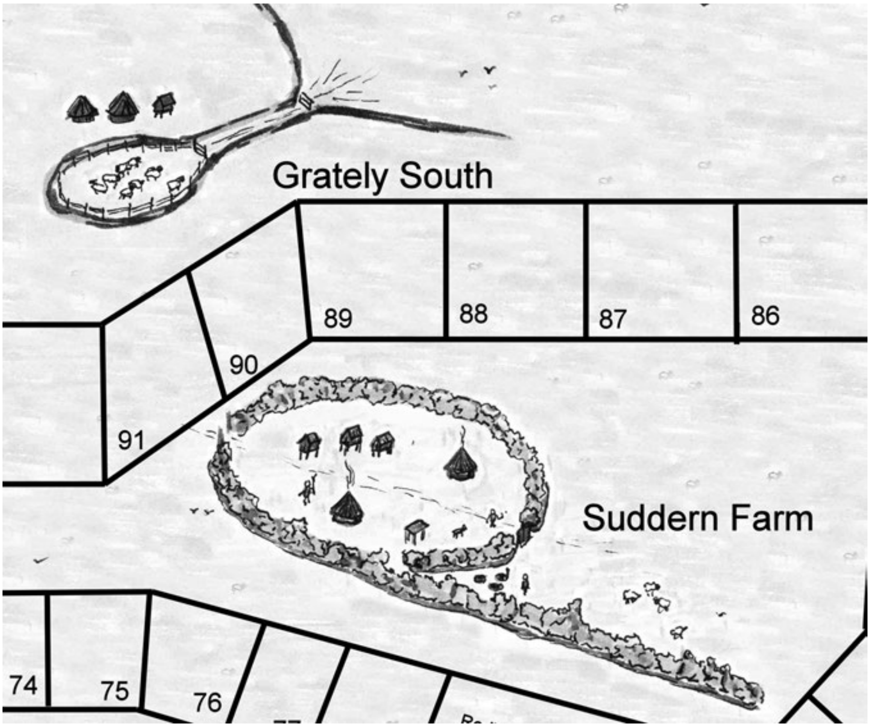

Grately South
89
88
87
86
90
91
Suddern Farm
74
75
76

Figure 8.9 Detail from the Danebury Environs Game, illustrating the representational style of the map (image created by the author).

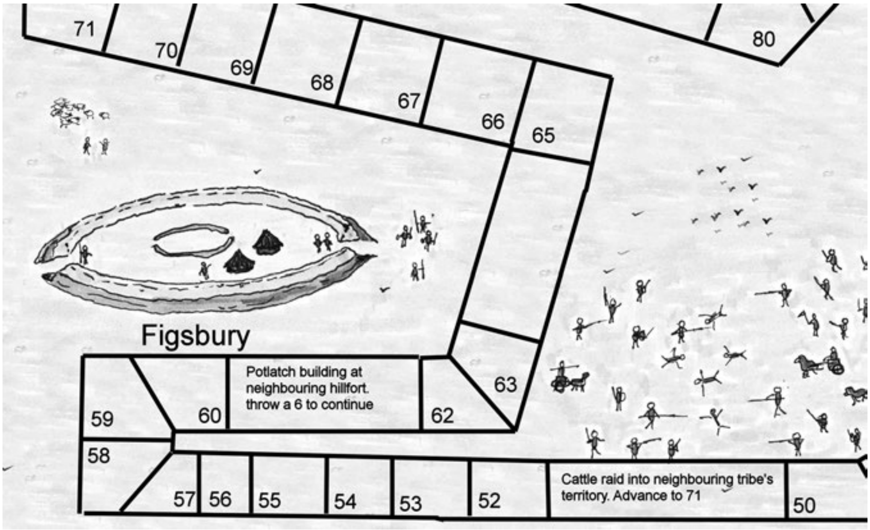

71
70
69
68
67
66
65
80
Figsbury
59
60
Potlatch building at neighbouring hillfort. throw a 6 to continue
62
63
58
57
56
55
54
53
52
Cattle raid into neighbouring tribe's territory. Advance to 71
50

Figure 8.10 Detail from the Danebury Environs Game, illustrating how concepts of British Iron Age society can be written into the map (image created by the author).

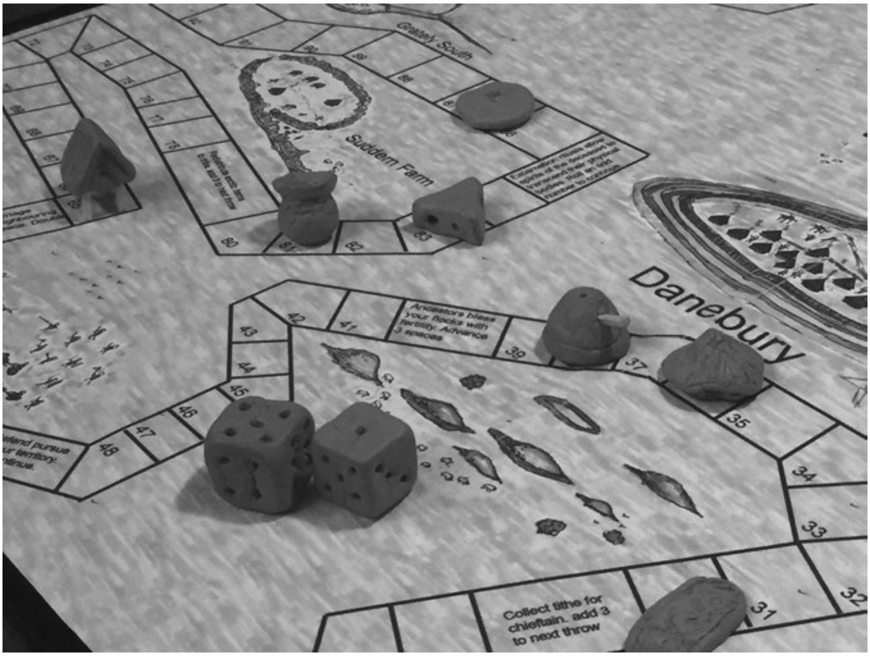

Gratelly South
Suddern Farm
Danebury
Ancestors bless your flocks with fertility. Advance 3 spaces
Collect tithe for chieftain. add 3 to next throw

Figure 8.11 Game pieces from the Danebury Environs Game, illustrating how the materiality of the past can be brought into game play (photograph by the author).

The game map can stand alone without any additional supporting information, but it does present opportunities to break out from the map to a publication. Each activity square could contain page or chapter references, making it easy for those that are interested to find out more. It can, therefore, form a useful educational tool. Material culture can be written into these as well, with counters in this example consisting of miniature Iron Age pots, chariots, shields etc. (Figure 8.11). The players thereby engage unconsciously with the physicality of the past. Like any map, it remains important not to make the map hard to read for the players by making the rules too complex or abstract. Simple but absorbing game play is the key to these maps and this can present a challenging, but rewarding, assignment for the cartographer.

This form of game with a path that players follow makes it like a movement map and can easily be applied to map journeys through a landscape. Monumental processional landscapes, such as Stonehenge or Avebury, lend themselves well to this kind of map but it could easily be mobilized to chart the colonization of Polynesia, the spread of Homo sapiens out of Africa, medieval pilgrimage routes or the grand tour of Italy. They can, of course also, be used to explore sites, including settlements, castles, cathedrals and cities. As these devices can be used to teach about things, such as the workings of societies, the factual, spatial accuracy of the maps becomes less important than the ideas that the players are engaged with. Through careful construction, the range of actions, whilst appearing superficially free, may direct the players down chosen paths frustrating alternative readings of history. Likewise, challenging game play can be used to encourage innovative solutions that confront commonly held perceptions of the past. Such maps are obviously well suited to transmitting messages to groups not usually catered to by maps such as children and families but may also be a valuable guerrilla learning tool employed by lecturers to stimulate otherwise uninterested undergraduate students.

Conclusions

> In my writing I am acting as a mapmaker, an explorer of psychic areas, a cosmonaut of inner space, and I see no point in exploring areas that have already been thoroughly surveyed.
>
> (William S. Burroughs, cited in Berry and McNeilly 2014, 68)

Archaeologists produce maps because they have information that they wish to represent. The success of creating this understanding is reliant upon how the map is used to portray these ideas to the target audience. It is in every cartographer's interest that their audience correctly understands their maps and, hence, that the maps are tailored to achieve this goal. The maps produced by most archaeologists are usually well suited for a research community but may not be quite so appropriate for other audiences. These audiences can feel excluded from academic debate by what they perceive as elitist arguments and obfuscation of the data. Moving the maps that we produce from Lefebvre's 'Representations of Space' with their scientific connotations and associations of reinforcing existing knowledge structures to 'representational space' with its artistic notions championing the underdog and giving a voice to the dispossessed, presents us with the opportunity to engage with these audiences.

In our Western-ethnocentric world, we have a very set idea about what a map is and what it does; how it must be accurate and objective. We need to remind ourselves that all maps are abstractions and regardless of their Cartesian fidelity they are mere analogies of the world rather than a representation of reality. Map Art in many ways harks back to earlier forms of mapping. It allows us to engage with different audiences in new ways by reducing the noise in the communication process for these groups.

The ideas I have advanced in this paper are intended to provide stimulation and starting points for others. It is not a formulaic process and is not codified. To produce meaningful maps we need to think hard about what messages we are intending to transmit, who our target audiences are and what the best way of creating that understanding is. Rather than following a formulaic methodology, maps need to be produced as unique pieces of work crafted in a way specific to the ideas it represent and the audiences that will access it. This will often coexist within a fusion of scientific and non-scientific techniques (MacEachren 1995, 12). Map Art challenges us to become better communicators and demands practice, trial and error but is ultimately a fun and rewarding activity for cartographers and their audience.

References

Alfrey, N. 2012. *'Ten Miles on Exmoor'*, Tate Papers, no. 17, Spring 2012. www.tate.org.uk/research/publications/tate-papers/17/ten-miles-on-exmoor. Accessed 14 February 2017.

Arnold, B. 1996. The Past as Propaganda: Totalitarian Archaeology in Nazi Germany. In R.W. Preucel and I. Hodder (eds.), *Contemporary Archaeology in Theory: A Reader*, 549–569. Oxford: Blackwell.

Berry, J.K. 2011. *Personal Geographies: Explorations in Mixed-Media Mapmaking*. Cincinnati: North Light Books.

Berry, J.K. and McNeilly, L. 2014. *Map Art Lab: 52 Exciting Art Explorations in Map Making, Imagination, and Travel*. Beverley, MA: Quarry Books.

Bertin, J. 1983. *Semiology of Graphics: Diagrams, Networks, Maps*. New York: Esri Press.

Bourdieu, P. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Cassirer, E. 1955. *The Philosophy of Symbolic Forms, Volume III: The Phenomenology of Knowledge*. New Haven: Yale University Press.

Coulson, M.R.C. 1977. Political truth and the graphic image. *Canadian Cartographer* 14 (2): 101–111.

Cunliffe, B. 2008. *The Danebury Environs Roman Programme: A Wessex Landscape during the Roman Era*. Oxford: University School of Archaeology.

Debord, G. 1983. *The Society of the Spectacle*. London: Rebel Press.

Foucault, M. 1984. Space, Knowledge and Power. In P. Rabinow (ed.), *The Foucault Reader: An Introduction to Foucault's Thought*. London: Penguin.

Guiraud, P. 1975. *Semiology*. London: Routledge and Kegan Paul.

Harley, J.B. 1988. Maps, Knowledge and Power. In D. Cosgrove and S. Daniels (eds.), *The Iconography of Landscape*, 277–312. Cambridge: Cambridge University Press.

Harley, J.B. 1989. Deconstructing the map. *Cartographica* 26 (2): 1–20.

Harmon, K. and Clemans, G. 2009. *The Map as Art: Contemporary Artists Explore Cartography*. New York: Princeton Architectural Press.

Heidegger, M. 1996 [1927]. *Being and Time*. Albany: SUNY Press.

Husserl, E. 2012 [1913]. *Ideas: General Introduction to Pure Phenomenology*. Abingdon: Routledge.

Keates, J.S. 1996. *Understanding Maps*. Harlow: Longman.

Klippel, A., Hardisty, F. and Li, R. 2011. Interpreting spatial patterns: An inquiry into formal and cognitive aspects of Tobler's first law of geography. *Annals of the Association of American Geographers* 101 (5): 1011–1031.

Kraak, M.J. 2008. From geovisualisation toward geovisual analytics. *The Cartographic Journal* 45 (3): 163–164.

Lefebvre, H. 1991. *The Production of Space*. Oxford: Blackwell.

Lock, G., Gosden, C. and Daly, P. 2005. *Segsbury Camp: Excavations in 1996 and 1997 at an Iron Age Hillfort on the Oxfordshire Ridgeway*. Oxford: University School of Archaeology Monograph 61.

MacEachren, A.M. 1995. *How Maps Work: Representation, Visualization, and Design*. New York: Guilford Press.

Ordnance Survey 2017. www.ordnancesurvey.co.uk/docs/legends/50k-raster-legend.pdf Accessed 11th February 2017.

Piggott, S. 1931. Ladle Hill: An unfinished hillfort. *Antiquity* 5: 474–485.

Rapoport, A. 1952. What is semantics? *American Scientist* 40: 123–135.

Ratajski, L. 1973. The research structure of theoretical cartography. *International Yearbook of Cartography* 13.

Reinerth, H. (ed.) 1940. *Vorgeschichte der deutschen Stämme: germanische Tat und Kultur auf deutschem Boden*. Berlin: Bibliographisches Institut.

Robinson, A.H. and Petchenik, B.B. 1975. The map as a communication system. *The Cartographic Journal* 12 (1): 7–15.

Robinson, A.H. and Petchenik, B.B. 1976. *The Nature of Maps*. Chicago: University of Chicago Press.

Rogerson, P.A. 2001. *Statistical Methods for Geography*. London: Sage.

Shields, R. 1999. *Lefebvre, Love, and Struggle: Spatial Dialectics*. London: Routledge.

Silberman, N.A. 1998. Whose Game Is It Anyway? The Political and Social Transformations of American Biblical Archaeology. In L. Meskell (ed.), *Archaeology under Fire: Nationalism, Politics and Heritage in the Eastern Mediterranean and Middle East*, 175–188. London: Routledge.

Sklenář, K. 1983. *Archaeology in Central Europe: The First 500 Years*. Leicester: Leicester University Press.

Smith, A. 1998. Landscapes of power in nineteenth century Ireland. *Archaeological Dialogues* 5 (1): 69–84.

Thomas, J.J. and Cook, K.A. (eds.) 2005. *Illuminating the Path: Research and Development Agenda for Visual Analytics*. Richland, WA: IEEE Press.

Tilley, C. 1994. *A Phenomenology of Landscape: Places, Paths, and Monuments*. Oxford: Berg.

Veit, U. 1989. Ethnic Concepts in German Prehistory: A Case Study on the Relationship between Cultural Identity and Archaeological Objectivity. In S.J. Shennan (ed.), 2003. *Archaeological Approaches to Cultural Identity*, 35–56. London: Routledge.

Vogel, L.I. 1993. *To See a Promised Land: Americans and the Holy Land in the Nineteenth Century*. University Park: Pennsylvania State University Press.

Wheeler, M. 1954. *The Stanwick Fortifications: North Riding of Yorkshire*. Oxford: The Society of Antiquaries, London.

Wood, D. 1992. *The Power of Maps*. New York: Guilford Press.

Wood, D. and Fels, J. 1986. Designs on signs: Myth and meaning in maps. *Cartographica* 23 (3): 54–103.

Wood, M. 1993. The map-users' response to map design. *The Cartographic Journal* 30 (2): 149–153.

Zimmermann, J. 2015. *Hermeneutics: A Very Short Introduction*. Oxford: Oxford University Press.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Describing Hermion/Ermioni

Between Pausanias and digital maps, a topology

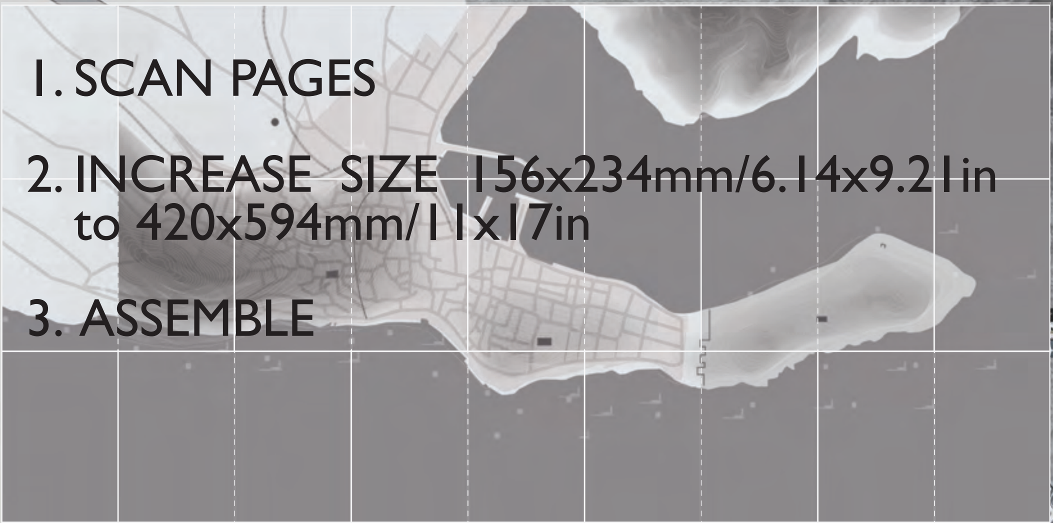
Caleb Lightfoot and Christopher Witmore

Keywords Description • Pausanias • the *Periegesis* • Ichnography • World Picture

Aims and aspirations

This project is for the patient observer. This statement is not meant as an insult to those who consider themselves lacking in patience. Only to proclaim at the outset that this project will bear more fruit for those who slow down and engage with it as both a reader and observer. As a reader, consider this project less as a "text" to be perused line by line, and more as palimpsest, with erasures, effacements, overwritten texts, and superimposed images. As an observer, consider this project less as "map" in the sense of an optically consistent, standardized, and combinable, flat projection whose powers rest upon a visual fidelity to particular internal qualities of things shown (size, shape, contours, etc.) and more as an experiment in descriptive visualization. In selecting our words, we are mindful of the Latin roots of the English word, "describe," found in *describere* – to manifest by drawing, mark out, to trace out, write out or down or on, to copy, represent, translate, prescribe, and establish.

In holding on to this polyvalence, which also suggests how enmeshed are matters of readership and observation, our aspirations are five in number. One, through the juxtaposition and comparison of two very different descriptions of a peninsula known successively as Hermion, Kastri, and Ermioni, Pausanias's *Periegesis*, and a collage of maps and other images, we hope to reveal not so much a common space, but a diversity of spaces. Two, in attempting to suggest something of these spaces, we push our descriptions to the edge of oversaturation and disruption, where too much information teeters on the verge of noise – and, thus, calling our attention to some of the most basic characteristics of both texts and maps (legibility, organization, consistency, fungibility, etc.) as modes of manifestation – we aim to challenge these forms, shift our bearings, and open up other descriptions for archaeologists and architects. Three, in designing our text and imagery as a topology we aim to accentuate pleats and rifts where different connections may be formed and for other spaces to emerge (for a complementary perspective, see Shanks 2004). Four, we aim to make the reader aware of the book, aware of the map, and aware of the difference digital media make. This difference arises out of designed difficulties; without the aid of a magnifying glass or digital translation, the text is almost too small to read in the form of a printed book; the map and aerial imagery disrupts the notion of homogeneous space across the whole and, as such, sparks heterogeneity. Five, our project lends itself to two very different engagements. As a reader, you may follow along page by page, through depth in a book, so that portions of the description are revealed in step with the progression; or, through another form of participation, you may photocopy each page, blow them up and print as 11x17 pages, and assemble them on an open, flat surface, a floor or a wall (after McLucas 2000). Here, you may choose to engage with information as you wish. Forge associations. Rework the arrangement of narratives. Enter into the work as a participant observer and different spaces will emerge.



1. SCAN PAGES
2. INCREASE SIZE 156x234mm/6.14x9.21in to 420x594mm/11x17in
3. ASSEMBLE

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Beach
174–181
June 14th 2017
205–209
216–229
162–173
Cemetery?
Bus top
2:00
3:00

Excerpt on Hermion from the *Periegesis*

2.35.11

By the gate through which runs the direct road to Mases there is a
πρὸς δὲ τῇ πύλῃ, καθ᾽ ἣν ὁδὸς εὐθεῖά ἐστιν ἄγουσα ἐπὶ Μάσητα, Εἰλειθυίας ἐστὶν
shrine of Eileithyia within the city walls. Every day they propitiate her
ἐντὸς τοῦ τείχους ἱερόν. ἄλλως μὲν δὴ κατὰ ἡμέραν ἑκάστην καὶ θυσίαις καὶ θυμιάμασι
lavishly with sacrifice and incense, and a great many dedications are
μεγάλως τὴν θεὸν ἱλάσκονται καὶ ἀναθήματα δίδοται πλεῖστα τῇ Εἰλειθυίᾳ: τὸ δὲ
made to the goddess. The statue can be seen only by the priestesses.
ἄγαλμα οὐδενὶ πλὴν εἰ μὴ ἄρα ταῖς ἱερείαις ἔστιν ἰδεῖν.

2.35.4

The most remarkable sanctuary is that of Demeter on the Pron. The
τὸ δὲ λόγου μάλιστα ἄξιον ἱερὸν Δήμητρός ἐστιν ἐπὶ τοῦ Πρωνός. τοῦτο τὸ ἱερὸν
Hermionians say that it was founded by Klymenos, the son of Phoro-
Ἑρμιονεῖς μὲν Κλύμενον Φορωνέως παῖδα καὶ ἀδελφὴν Κλυμένου Χθονίαν τοὺς
neus, and Chthonia [“of the Earth”], his sister. But the Argives claim
ἱδρυσαμένους φασὶν εἶναι. Ἀργεῖοι δέ, ὅτε ἐς τὴν Ἀργολίδα ἦλθε Δημήτηρ, τότε
that when Demeter came to the Argolid, Athera and Mysios showed
Ἀθέραν μὲν λέγουσι καὶ Μύσιον ὡς ξενίαν παράσχοιεν τῇ θεῷ, Κολόνταν δὲ οὔτε οἴκῳ
hospitality to the goddess, but Kolontas neither received her into his
δέξασθαι τὴν θεὸν οὔτε ἀπονεῖμαί τι ἄλλο ἐς τιμήν: ταῦτα δὲ οὐ κατὰ γνώμην Χθονίᾳ
house nor showed her respect in any other way. His daughter Chtho-
τῇ θυγατρὶ ποιεῖν αὐτόν. Κολόνταν μὲν οὖν φασιν ἀντὶ τούτων συγκαταπρησθῆναι
nia disagreed with her father’s behavior, because of which, they say,
τῇ οἰκίᾳ, Χθονίαν δὲ κομισθεῖσαν ἐς Ἑρμιόνα ὑπὸ Δήμητρος Ἑρμιονεῦσι ποιῆσαι τὸ
Kolontas and his house were destroyed by fire while Demeter took
ἱερόν.
Chthonia to Hermion to build her temple.

Pausanias

Pausanias, a name that does not appear in what has become of the text known as the *Periegesis*, is a name that is first associated with this work by Stephanus of Byzantium, some 350 years after the author’s death (Habicht 1985, 1). A Roman traveler, a religious pilgrim, an antiquarian, a literary stylist, the story of this author has dropped out of his story.

Pausanias’s Hermion

Along the mountainous route between Troezen and Hermion, Pausanias first mentions the Rock of Theseus, formerly the Altar of Zeus Sthenios, then the temple of Apollo Platanistios, and beyond Elileoi. He then breaks from the road to mention a sanctuary to Demeter Thermesia towards the sea and Cape Skyllaion, including the story of how the cape acquired its name. Shifting from a terrestrial to a maritime perspective, he moves on to list other headlands, harbors, and islands in sequence as one sails from the Cape to Hermion. Finally, from the harbors he returns to dry land, entering into the polis of Hermion where he will stay until he leaves by the gate on the direct route to Mases.

Beginning with the old town, which once encompassed the eastern half of the peninsula, Pausanias mentions the sanctuary of Poseidon on the point, followed by the temple of Athena and, among other things, a shrine whose roof had fallen in. From there, he shifts to describe the present town on the Pron (“foreland”) with its monuments, histories, and mores, including the sanctuary of Demeter Chthonia, the Echo Stoa, so named because of the three-fold return on any sound, even a whisper, and the chasm from which Herakles returned with the hound of Hades (2.35.4–10). Here, that which is worthy of note is described less in terms of topographical sequentiality along routes, and more as items contained within these walled enclosures (also Hutton 2005, 142–143). Respecting the spatial integrity of city walls (even if only one was fully standing), Pausanias describes Hermion as two separate spheres harboring concentrations of temples, sanctuaries, statues, and fountains, with their associated competitions, practices, and festivals. Thus, city walls are maintained as organizational forms.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

The goddess herself is called Chthonia, and they celebrate a festival,
Χθονίαν δ᾽ οὖν ἡ θεός τε αὐτὴ καλεῖται καὶ Χθόνια ἑορτὴν κατὰ ἔτος ἄγουσιν ὥρᾳ
the Chthonia, every summer. This is how they celebrate it. The priests
θέρους, ἄγουσι δὲ οὕτως· ἡγοῦνται μὲν αὐτοῖς τῆς πομπῆς οἵ τε ἱερεῖς τῶν θεῶν καὶ ὅσοι
of the gods and all the annual officials lead the procession, followed
τὰς ἐπετείους ἀρχὰς ἔχουσιν, ἕπονται δὲ καὶ γυναῖκες καὶ ἄνδρες. τοῖς δὲ καὶ παισὶν
by both women and men, and it is even their custom for children to
ἔτι οὖσι καθέστηκεν ἤδη τὴν θεὸν τιμᾶν τῇ πομπῇ· οὗτοι λευκὴν ἐσθῆτα καὶ ἐπὶ ταῖς
honor the goddess by taking part in the procession. They wear white
κεφαλαῖς ἔχουσι στεφάνους. πλέκονται δὲ οἱ στέφανοί σφισιν ἐκ τοῦ ἄνθους ὃ καλοῦσιν
garments and crowns on their heads. The crowns are woven of the
οἱ ταύτῃ κοσμοσάνδαλον, ὑάκινθον ἐμοὶ δοκεῖν ὄντα καὶ μεγέθει καὶ χρόᾳ· ἔπεστι δὲ
flower they call *kosmosandalon* there, which seems to me in size and
οἱ καὶ τὰ ἐπὶ τῷ θρήνῳ γράμματα.
color to be a *huakinthos*. It has on it the letters of lamentation [*AI*].

After the people participating in the procession come men bringing
τοῖς δὲ τὴν πομπὴν πέμπουσιν ἕπονται τελείαν ἐξ ἀγέλης βοῦν ἄγοντες διειλημμένην
a full-grown cow taken from the herd. She is controlled by ropes and
δεσμοῖς τε καὶ ὑβρίζουσαν ἔτι ὑπὸ ἀγριότητος. ἐλάσαντες δὲ πρὸς τὸν ναὸν οἱ μὲν
is still violent because she is untamed. When they have driven the
ἔσω φέρεσθαι τὴν βοῦν ἐς τὸ ἱερὸν ἀνῆκαν ἐκ τῶν δεσμῶν, ἕτεροι δὲ ἀναπεπταμένας
cow up to the temple, some men release the cow to rush into the
ἔχοντες τέως τὰς θύρας, ἐπειδὰν τὴν βοῦν ἴδωσιν ἐντὸς τοῦ ναοῦ, προσέθεσαν τὰς
sanctuary, while others hold its doors open; when they see the cow
θύρας.
is in the temple, they close the doors.

2.35.5

2.35.6

Periegesis Hellados

Though commonly translated as the *Description of Greece*, "leading around Greece" more precisely captures the meaning of *Periegesis Hellados*. The longest example of ancient travel literature in existence (see Elsner 1992; Hutton 2005, 7), the *Periegesis* leads its readers around with more than descriptions of land, cities, or monuments. Genealogies, localized myths, and ritual practices are among its bewilderingly diverse objects of concern. Because of the *Periegesis* we have not forgotten that tradition forbad the Corinthians from entering the *temenos* of Necessity and Violence on the slopes of Acrocorinth; we understand that priestesses of the Argive Heraion made garlands of asterion, an herb found on the banks of the river by the same name, for the cow-eyed goddess; we know that the chryselephantine statue of Hera was made by Polykleitos and crowned with a diadem decorated with the Graces and Seasons. Because of this text, such things have not passed to *Lethe*.

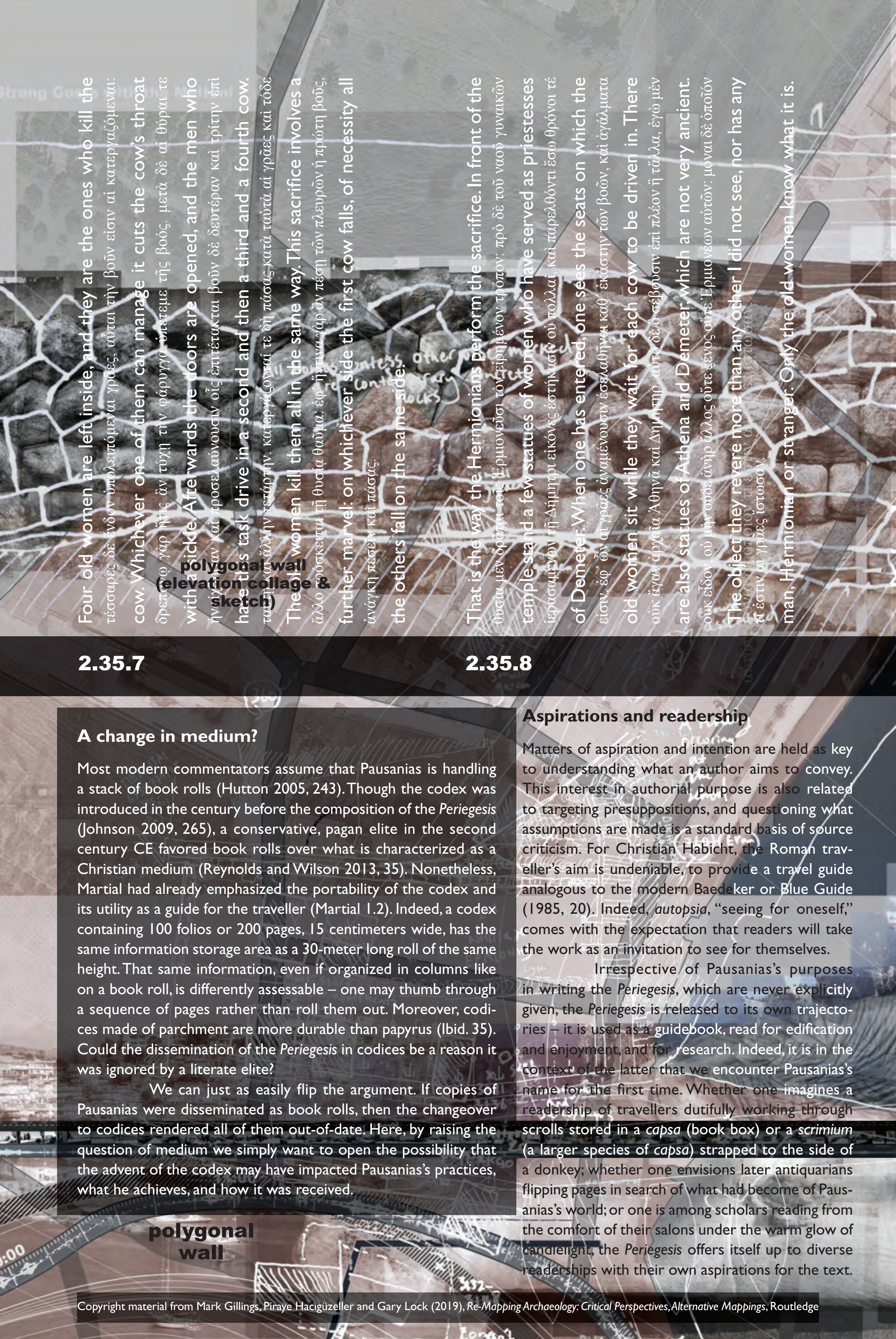
ancient well
(Jameson)

Worthy of mention

Pausanias selects only those things that he deems to be worthy of mention (*axiologótata*), or most worthy of mentioning or remembering (*málista áxia mnímis*) (3.11.1). What makes objects of experience stand out as worthy of inclusion and therefore objects of contemplation?

While literary tradition, audience, and intellectual milieu exert their influence (Hutton 2005, 5), selection also may be considered in terms of both exhibition and aesthetics. Pausanias mentions what he deemed to be gratifying as a participant observer engaging objects "installed" within public spaces. We might well understand the situation of architectures and objects within poleis and sanctuaries in terms of purposeful design, where invested citizens, priests, or patrons "endeavor to strengthen the position of the work vis-à-vis the observer" (Sloterdijk 2005, 948). From here we may consider another sense of aesthetics, which owes less to the author's own personal predilections, and more to the propensity of those objects present to draw Pausanias in with feeling. God-pleasing works of art and the artists who made them, the potency of places with their connections to cult, heroes, the gods, and historical events, or objects possessed of the deity (for Pausanias, some statues or images were *éntheon*, 2.4.5), such are the things that grab the periegete's attention.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge



polygonal wall (elevation collage & sketch)

polygonal wall

Four old women are left inside, and they are the ones who kill the
τέσσαρες δὲ ἔνδον ὑπολειπόμεναι γρᾶες, αὗται τὴν βοῦν εἰσιν αἱ κατεργαζόμεναι:
cow. Whichever one of them can manage it cuts the cow's throat
δρεπάνῳ γὰρ ἥτις ἂν τύχῃ τὴν φάρυγγα ὑπέτεμε τῆς βοός. μετὰ δὲ αἱ θύραι τε
with a sickle. Afterwards the doors are opened, and the men who
ἠνοίχθησαν καὶ προσελαύνουσιν οἷς ἐπιτέτακται βοῦν δὲ δευτέραν καὶ τρίτην ἐπὶ
have this task drive in a second and then a third and a fourth cow.
ταύτῃ καὶ ἄλλην τετάρτην. κατεργάζονταί τε δὴ πάσας κατὰ ταὐτὰ αἱ γρᾶες καὶ τόδε
The women kill them all in the same way. This sacrifice involves a
ἄλλο πρόσκειται τῇ θυσίᾳ θαῦμα: ἐφ᾽ ἥντινα γὰρ ἂν πέσῃ τῶν πλευρῶν ἡ πρώτη βοῦς,
further marvel: on whichever side the first cow falls, of necessity all
ἀνάγκη πεσεῖν καὶ πάσας.
the others fall on the same side.

2.35.7

That is the way the Hermionians perform the sacrifice. In front of the
θυσία μὲν δρᾶται τοῖς Ἑρμιονεῦσι τὸν εἰρημένον τρόπον: πρὸ δὲ τοῦ ναοῦ γυναικῶν
temple stand a few statues of women who have served as priestesses
ἱερασαμένων τῇ Δήμητρι εἰκόνες ἑστήκασιν οὐ πολλαί, καὶ παρελθόντι ἔσω θρόνοι τέ
of Demeter. When one has entered, one sees the seats on which the
εἰσιν, ἐφ᾽ ὧν αἱ γρᾶες ἀναμένουσιν ἐσελαθῆναι καθ᾽ ἑκάστην τῶν βοῶν, καὶ ἀγάλματα
old women sit while they wait for each cow to be driven in. There
οὐκ ἄγαν ἀρχαῖα Ἀθηνᾶ καὶ Δημήτηρ. αὐτὸ δὲ ὃ σέβουσιν ἐπὶ πλέον ἢ τἄλλα, ἐγὼ μὲν
are also statues of Athena and Demeter, which are not very ancient.
οὐκ εἶδον, οὐ μὴν οὐδὲ ἀνὴρ ἄλλος οὔτε ξένος οὔτε Ἑρμιονέων αὐτῶν: μόναι δὲ ὁποῖόν
The object they revere more than any other I did not see, nor has any
τί ἐστιν αἱ γρᾶες ἴσασιν.
man, Hermionian or stranger. Only the old women know what it is.

2.35.8

A change in medium?

Most modern commentators assume that Pausanias is handling a stack of book rolls (Hutton 2005, 243). Though the codex was introduced in the century before the composition of the *Periegesis* (Johnson 2009, 265), a conservative, pagan elite in the second century CE favored book rolls over what is characterized as a Christian medium (Reynolds and Wilson 2013, 35). Nonetheless, Martial had already emphasized the portability of the codex and its utility as a guide for the traveller (Martial 1.2). Indeed, a codex containing 100 folios or 200 pages, 15 centimeters wide, has the same information storage area as a 30-meter long roll of the same height. That same information, even if organized in columns like on a book roll, is differently assessable – one may thumb through a sequence of pages rather than roll them out. Moreover, codices made of parchment are more durable than papyrus (Ibid. 35). Could the dissemination of the *Periegesis* in codices be a reason it was ignored by a literate elite?

We can just as easily flip the argument. If copies of Pausanias were disseminated as book rolls, then the changeover to codices rendered all of them out-of-date. Here, by raising the question of medium we simply want to open the possibility that the advent of the codex may have impacted Pausanias's practices, what he achieves, and how it was received.

Aspirations and readership

Matters of aspiration and intention are held as key to understanding what an author aims to convey. This interest in authorial purpose is also related to targeting presuppositions, and questioning what assumptions are made is a standard basis of source criticism. For Christian Habicht, the Roman traveller's aim is undeniable, to provide a travel guide analogous to the modern Baedeker or Blue Guide (1985, 20). Indeed, *autopsia*, "seeing for oneself," comes with the expectation that readers will take the work as an invitation to see for themselves.

Irrespective of Pausanias's purposes in writing the *Periegesis*, which are never explicitly given, the *Periegesis* is released to its own trajectories – it is used as a guidebook, read for edification and enjoyment, and for research. Indeed, it is in the context of the latter that we encounter Pausanias's name for the first time. Whether one imagines a readership of travellers dutifully working through scrolls stored in a *capsa* (book box) or a *scrimium* (a larger species of *capsa*) strapped to the side of a donkey; whether one envisions later antiquarians flipping pages in search of what had become of Pausanias's world; or one is among scholars reading from the comfort of their salons under the warm glow of candlelight, the *Periegesis* offers itself up to diverse readerships with their own aspirations for the text.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

That is all the Hermionians have there. The present town is about 4 stades
τοσαῦτα μὲν Ἑρμιονεῦσίν ἐστιν ἐνταῦθα· ἡ δὲ ἐφ' ἡμῶν πόλις ἀπέχει μὲν τῆς ἄκρας,
from the tip of the point with the sanctuary of Poseidon. It lies at first on
ἐφ' ᾗ τοῦ Ποσειδῶνος τὸ ἱερόν, τέσσαρας μάλιστα σταδίους, κειμένη δὲ ἐν ὁμαλῷ τὰ
level ground but gradually rises on the slopes of the Pron ["Foreland"],
πρῶτα ἠρέμα ἐς πρόσαντες ἄνεισι, τὸ δέ ἐστιν ἤδη τοῦ Πρωνός· Πρῶνα γὰρ τὸ ὄρος
which is what they call the mountain. A circuit wall around the whole
τοῦτο ὀνομάζουσι. τεῖχος μὲν δὴ περὶ πᾶσαν τὴν Ἑρμιόνα ἕστηκε· τὰ δὲ ἐς συγγραφὴν
of Hermion is standing. Of the things of interest the town offers I have
καὶ ἄλλα παρείχετο καὶ ὧν αὐτὸς ποιήσασθαι μάλιστα ἠξίωσα μνήμην. Ἀφροδίτης
selected those that I thought particularly worth recording. There is a temple
ναός ἐστιν ἐπίκλησιν Ποντίας καὶ Λιμενίας τῆς αὐτῆς, ἄγαλμα δὲ λευκοῦ λίθου μεγέθει
of Aphrodite with the epithet "of the Deep Sea [*Pontia*] and the Harbor"
τε μέγα καὶ ἐπὶ τῇ τέχνῃ θέας ἄξιον.
[*Limenia*]. Her statue is of marble, large, and worth seeing for its quality

A chain of production

In placing aside old tendencies to read the *Periegesis* as a direct account of a grand tour through Greece we may understand the text as a refined work of travel literature (Hutton 2005, 20–29). Thus, we might envision a chain of production for the *Periegesis* as follows:

- the acquisition of *lógoi* and *theorémata* through *autopsia*, whether details are retained through grey-matter memory or inscribed as notations;
- the organization and management of information so that it could be brought back with him to a location where it could be further collated, annotated, arranged, etc.;
- an ongoing reassessment of what has been acquired through synoptic juxtaposition, comparison, connection, cross referencing, etc.;
- written composition;
- and, lastly, publication.

Save for the composition and publication, and after initial forays into similar literature and visits to different sites, *autopsia*, organization, and reassessment need not be regarded as rigidly linear in their relationship.

2.34.11

Periegesis, an achievement

Pausanias rarely mentions his craft. He says nothing of the process whereby he translates what he observes into literature. From his visit to the polis of Hermion to Book II of what will become the *Periegesis*, we lack this ichnography. Nonetheless, something of the tracks suggestive of the steps he took in writing the *Periegesis* remains as scarce details gleaned from the margins of his text.

A participant observer, Pausanias aimed to sort (*apokrínai*) by discarding what he deemed to be trivial and gather (*légein*) what was worthy of mention (*axiologótata*) into his account (*lógos*) (consider 3.11.1). Writing as he moved on the ground – by autopsy (*autopsia*) – Pausanias gathered *lógoi*, both spoken and written words, and *theorémata*, what was to be seen on the ground (Habicht 1985, 21). A well-blended mixture of observation, discussions of inscriptions read and storytelling on the basis of oral accounts characterizes the *Periegesis*. This, most scholars agree, was an achievement more than a decade, perhaps considerably more, in the making (see Habicht 1985, 9–11; Hutton 2005, 17–18).

sarcophagus (collage)

Multiplication

Just as the question of purpose looms over the text, so too does the question of multiplication. "How many copies of the text were produced and how far was it disseminated?" Diller's (1956, 84) question, despite ancient silence regarding Pausanias's achievement, draws attention to matters of distribution. Here, arguments have ranged from understanding the *Periegesis* as a popular travel guide carried by Roman tourists to a document in private circulation among friends to the only hand-written version in existence, rescued from oblivion by being deposited in a major library (Schubart 1853; also see Diller 1957, 169–170; Habicht 1985, 1). Was the *Periegesis* singular and ignored, or popular and oversubscribed? Nothing can be gleaned in either direction.

Dating to as early as 1450, the oldest surviving copies of the *Periegesis* all appear to derive from a single codex, no longer in existence, which belonged to Niccolò Niccoli of Florence. After the 1516 printing of the *editio princeps* prepared by Marcus Musurus for the Aldine Press Pausanias would find its way into Northern European libraries, studies, and even saddlebags (the 1516 print run included both *quarto*, with pages at one-fourth the size of a sheet of paper, and *duodecimo*, with pages at one-twelfth of a sheet, formats).

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Panorama taken here
<1
5
7

2.35.9

There is also a second temple with statues standing all around it. It is across from the temple of Chthonia and is called the temple of Klymenos, and they sacrifice to him there. I do not believe Klymenos was an Argive man who came to Hermion. Klymenos [“The Famous One”] is an epithet of the god who, the story goes, is king under the earth.

ἔστι δὲ καὶ ἄλλος ναός: εἰκόνες δὲ περὶ πάντα ἑστήκασιν αὐτόν. οὗτος ὁ ναός ἐστιν ἀπαντικρὺ τοῦ τῆς Χθονίας, καλεῖται δὲ Κλυμένου, καὶ τῷ Κλυμένῳ θύουσιν ἐνταῦθα. Κλύμενον δὲ οὐκ ἄνδρα Ἀργεῖον ἐλθεῖν ἔγωγε ἐς Ἑρμιόνα ἡγοῦμαι, τοῦ θεοῦ δέ ἐστιν ἐπίκλησις, ὅντινα ἔχει λόγος βασιλέα ὑπὸ γῆν εἶναι.

2.35.10

Alongside this temple there is yet another one, with a statue of Ares, and on the right side there is a *stoa* [portico], part of the sanctuary of Chthonia, which the local people call the Echo Stoa. Even if one whispers as quietly as possible the sound is returned three times as loud. Behind the temple of Chthonia are three places that the Hermionians call “Klymenos’s,” “Plouton’s,” and the Acherousian Lake. All three are surrounded by curbs of stone, and in Klyrnenos’s there is a hole in the earth through which Herakles brought up the hound of Hades, according to the Hermionians’ story.

παρὰ μὲν δὴ τοῦτόν ἐστιν ἄλλος ναὸς καὶ ἄγαλμα Ἄρεως, τοῦ δὲ τῆς Χθονίας ἐστὶν ἱεροῦ στοὰ κατὰ τὴν δεξιάν, Ἠχοῦς ὑπὸ τῶν ἐπιχωρίων καλουμένη: φθεγξαμένῳ δὲ ἀνδρὶ τὰ ὀλίγιστα ἐς τρὶς ἀντιβοῆσαι πέφυκεν. ὄπισθεν δὲ τοῦ ναοῦ τῆς Χθονίας χωρία ἐστὶν ἃ καλοῦσιν Ἑρμιονεῖς τὸ μὲν Κλυμένου, τὸ δὲ Πλούτωνος, τὸ τρίτον δὲ αὐτῶν λίμνην Ἀχερουσίαν. περιείργεται μὲν δὴ πάντα θριγκοῖς λίθων, ἐν δὲ τῷ τοῦ Κλυμένου καὶ γῆς χάσμα: διὰ τούτου δὲ Ἡρακλῆς ἀνῆγε τοῦ Ἅιδου τὸν κύνα κατὰ τὰ λεγόμενα ὑπὸ Ἑρμιονέων.

Ichnography 1: Pausanias

The *Periegesis* appears as the *telos* of a chain of metamorphoses, which has been obscured. *Ichnos* is the Greek word for the trace of the step, the footprint. The ichnography is the complete chain of transformation, from the steps taken in production through the cascade of forms that follow. Aubrey Diller (1956, 1957) has attempted to trace the chain of copies through the manuscript tradition. Stephanus Byzantius, a grammarian working in Constantinople probably in the reign of Justinian, references a copy in his fifty-book *Ethnica*. A tenth-century scholium hints at the existence of a copy of the *Periegesis* in Constantinople (Diller 1956, 86). Excerpts from Pausanias are found in a late thirteenth century collection by Maximus Planudes (Ibid. 90). After the turn of the fifteenth century a copy is passed between friends in Northern Italy.

Media reconsidered

The error of considering the possibility that the *Periegesis* was originally published in codex form lies in two assumptions: 1) that portability is of importance for a “travel guide” in the second century CE; and 2) that the book was read in the midst of travel. If the *Periegesis* was crafted as a contribution to literature, one might argue that portability is of little consequence to a readership behind four walls. Furthermore, even if the book was used for travel, one has to take into consideration the memorization practices of the time – relevant portions of the book could be carried around within the traveller (see Hutton 2005, 243).

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Near it is a temple of Dionsysos Melanaigis [“of the Black Goat”].
35.1 πλησίον δὲ αὐτοῦ Διονύσου ναὸς Μελαναίγιδος: τούτῳ μουσικῆς ἀγῶνα κατὰ
They conduct an annual musical competition for him and also have
ἔτος ἕκαστον ἄγουσι, καὶ ἁμίλλης κολύμβου καὶ πλοίων τιθέασιν ἆθλα: καὶ Ἀρτέμιδος
contests in swimming [or diving] and rowing. There is also a sanctuary
ἐπίκλησιν Ἰφιγενείας ἐστὶν ἱερὸν καὶ Ποσειδῶν χαλκοῦς τὸν ἕτερον πόδα ἔχων ἐπὶ
of Artemis with the epithet Iphigeneia, and a bronze statue of Posei-
δελφῖνος. παρελθοῦσι δὲ ἐς τὸ τῆς Ἑστίας, ἄγαλμα μὲν ἐστιν οὐδέν, βωμὸς δέ:
don with one foot resting on a dolphin. As one proceeds one passes a

shrine of Hestia [Hearth], which has no statue but does have an altar

on which they sacrifice to her.

2.35.1

Pausanias the guide

As with so many other poleis, the *Periegesis* provided the general position, sequence, and relationship between the various monuments in ancient Hermion. What had become of what Pausanias had described? This question had guided antiquarians in their observations and acquisitions (a term used here to emphasize the primary need to return home with both antiquities and information; see Witmore and Buttrey 2008; also Pretzler 2007, 130–150; Wagstaff 2001). Whether they confirmed or disputed previous antiquarian identifications, later Classical topographers and archaeologists, including Ernst Curtius, Alexandros Philadelpheus, and Michael Jameson rarely avoided weighing in on the naming of what had become of the past with Pausanias as their guide.

Use of architectural remains on the Bisti (the Albanian word for tail) as convenient quarries for finished building stone (cf. Leake 1830 II, 461; Curtius 1852 II, 457) did little to dampen attempts to connect extant ruins with ancient referents. For example, the large peristyle foundations in the saddle of the Bisti were first associated with the sanctuary of the earth-shaking sea god by Sir William Gell (1810). Philadelphieus (1909), followed by Faraklas (1973), later identified it with the temple of Athena, only to be challenged again by Jameson who favored Gell’s naming (Jameson, Runnels and van Andel 1994, 590; McAllister 1969).

On the Pron, given the presence of the town, the inventory and naming of extant remains proved just as cumbrous. Among the most discussed lures are two long, east – west stretches of trapezoidal wall (40 m and 15 m in length and 3 m in height). August Frickenhaus and Walter Müller (1911) associated these walls with the Echo Stoa. Building on an oblique reference to blocks of stone transported up from the harbor in an inscription of similar date (*Inscriptions Graecae* IV: 742) Michael Jameson later connected these remnants with the precinct wall of the sanctuary of Demeter Chthonia (Jameson, Runnels and Van Andel 1994, 593). Pausanias not only provided the lexicon, but also gave weight to the taxonomic impulse to order and name.

Toponymic engineering

Where stones proved too obstinate to regain their lost names, the town as a whole would oblige. Kastri was officially renamed Ermioni by 1845. Karakasi was renamed Iliokastro, after the ancient Eileoi, in 1927. Tsamliza was dropped in favor of Idhra for the island of ancient Hydrea. Hermion, Eileoi, Hydrea: Pausanias would play a central role in a pervasive toponymic engineering whereby a semantic ‘de-distancing’ of the past followed on rendering contemporary names to oblivion. Sooner or later, virtually every map of Greece since the Greek War of Independence has been found in need of toponymic updating.

‘Mapping’ the Periegesis

Nearly every commentator on Pausanias since the late-nineteenth century has been compelled to project the *Periegesis* onto a base map. Situating a route, a path, a way through, begins with the situation of the planimetric perspective (compare Elsner 2001; Habicht 1985; Hutton 2005). This is no less the case with his descriptions of cities than with the longer routes he took through particular territories. Through the two-dimensional scenography the *Periegesis* is judged. In mapping what are assumed to be Pausanias’s movements, the projected infrastructure becomes the beginning for understanding infrastructures that were never projected (also see Stewart 2013, 240–243).

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

2.35.2

There are three temples of Apollo and three statues. One has no epi-
2. καὶ ἐπ᾽ αὐτοῦ θύουσιν Ἑστίᾳ. Ἀπόλλωνος δέ εἰσι ναοὶ τρεῖς καὶ ἀγάλματα τρία: καὶ
thets, but the second is Pythaeus and the third is called Horios [“of the
τῷ μὲν οὐκ ἔστιν ἐπίκλησις, τὸν δὲ Πυθαέα οὕτως ὀνομάζουσι, καὶ Ὅριον τὸν τρίτον. τὸ
Borders”]. They learned the name Pythaeus from the Argives. For Tele-
μὲν δὴ τοῦ Πυθαέως ὄνομα μεμαθήκασι παρὰ Ἀργείων: τούτοις γὰρ Ἑλλήνων πρώτοις
silla [the Argive poetess of the 5th century BCE] says that Pythaeus,
ἀφικέσθαι Τελέσιλλά φησι τὸν Πυθαέα ἐς τὴν χώραν Ἀπόλλωνος παῖδα ὄντα: τὸν δὲ
the son of Apollo, came first to the Greeks in their land [Argos]. As
Ὅριον ἐφ᾽ ὅτῳ καλοῦσιν, σαφῶς μὲν οὐκ ἂν ἔχοιμι εἰπεῖν, τεκμαίρομαι δὲ περὶ γῆς
for why they call Apollo “of the Borders,” I cannot say for certain, but
ὅρων πολέμῳ σφᾶς ἢ δίκῃ νικήσαντας ἐπὶ τῷδε τιμὰς Ἀπόλλωνι Ὁρίῳ νεῖμαι.
I surmise that when they had won a war or a dispute over the borders

of their land they decided to honor the god with this epithet.

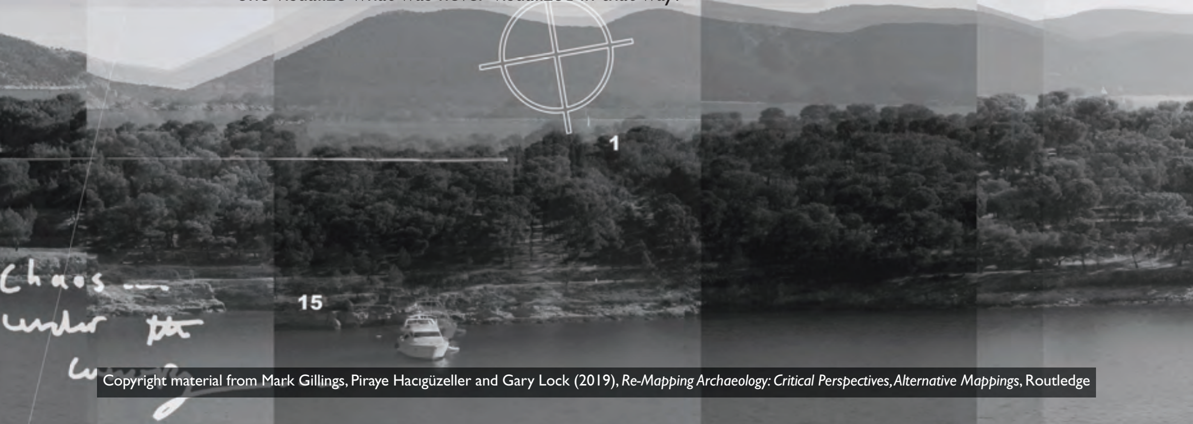
2.35.3

The sanctuary of Tyche [Fortune] the Hermionians say is their most
3. τὸ δὲ ἱερὸν τῆς Τύχης νεώτατον μὲν λέγουσιν Ἑρμιονεῖς τῶν παρά σφισιν εἶναι, λίθου
recent. In it stands a colossal statue of Parian marble. They have two
δὲ Παρίου κολοσσὸς ἕστηκεν. κρήνας δὲ τὴν μὲν σφόδρα ἔχουσιν ἀρχαίαν, ἐς δὲ αὐτὴν
fountains, one of which is very ancient. One cannot see the water
οὐ φανερῶς τὸ ὕδωρ κάτεισιν, ἐπιλείποι δὲ οὐκ ἄν ποτε, οὐδ᾽ εἰ πάντες καταβάντες
coming into it, but it never fails, not even if the whole population goes
ὑδρεύοιντο ἐξ αὐτῆς: τὴν δὲ ἐφ᾽ ἡμῶν πεποιήκασιν, ὄνομα δὲ ἐστιν τῷ χωρίῳ Λειμών,
down to draw water from it. The other they built in our times, and
ὅθεν ῥεῖ τὸ ὕδωρ ἐς αὐτήν.
the name of the place from which the water flows [by aqueduct] is

called Leimon [“Meadow”].

Order of the text

In this section we break the order of the *Periegesis* and rearrange it on the basis of its relationship to positions along the peninsula. Each section is pegged to where the things mentioned are to be found along the peninsula. Our agenda in intentionally betraying the order and, therefore, the integrity of the text is to drive home a point: it is no less a betrayal to visualize Pausanias’s routes *on* optically consistent and standardized maps, only to then visualize the *Periegesis through* such maps. How does one visualize what was never visualized in that way?



Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Translation from Jameson, Runnels and Van Andel 1995, 581-84
Greek text from Pausanias. 1903. Pausaniae Graeciae Descriptio, 3 vols. Leipzig: Teubner

An island called Aperopia lies before Bouporthmos, and not far from
ἐπίκλησις δέ ἐστι τῇ θεῷ Προμαχόρμα. πρόκειται δὲ Βουπόρθμου νῆσος Ἀπεροπία
Aperopia is another island, Hydrea. After this [Aperopia (Dhokos)]
καλουμένη, τῆς δὲ Ἀπεροπίας ἀφέστηκεν οὐ πολὺ ἑτέρα νῆσος Ὑδρέα. μετὰ ταύτην
there is a stretch of crescent-shaped beach on the mainland, and after
αἰγιαλός τε παρήκει τῆς ἠπείρου μηνοειδὴς καὶ ἀκτὴ μετὰ τὸν αἰγιαλὸν ἐπὶ Ποσείδιον,
the beach a point ending in a sanctuary of Poseidon. The tip of the
ἐκ θαλάσσης μὲν ἀρχομένη τῆς πρὸς ἀνατολάς, προήκουσα δὲ ὡς ἐπὶ τὴν ἑσπέραν: ἔχει
point in the sea is on the east and runs from there to [the mainland
δὲ καὶ λιμένας ἐν αὐτῇ. μῆκος μὲν δὴ τῆς ἀκτῆς ἐστιν ἑπτά που στάδια, πλάτος δὲ ᾗ
on] the west. There are harbors on it. The length of the point is about
πλατυτάτη σταδίων τριῶν οὐ πλέον.
7 stades, and its width, at the widest, is no more than 3 stades.

2.34.10

This is where the Hermionians had their earlier town. They still have sanc-
ἐνταῦθα ἡ προτέρα πόλις τοῖς Ἑρμιονεῦσιν ἦν. ἔστι δέ σφισι καὶ νῦν ἔτι ἱερὰ αὐτόθι,
tuaries there, one of Poseidon at the tip of the point, and then as one comes
Ποσειδῶνος μὲν ἐπὶ τῆς ἀκτῆς τῇ ἀρχῇ, προελθοῦσι δὲ ἀπὸ θαλάσσης ἐς τὰ μετέωρα
up from the sea a temple of Athena. Alongside it are foundations of a sta-
ναὸς Ἀθηνᾶς, παρὰ δὲ αὐτῷ σταδίου θεμέλια: ἐν δὲ αὐτῷ τοὺς Τυνδάρεω παῖδας
dium in which they say the sons of Tyndareus [the Dioskouroi] competed.
ἀγωνίσασθαι λέγουσιν. ἔστι δὲ καὶ ἕτερον οὐ μέγα τῆς Ἀθηνᾶς ἱερόν, ὁ δὲ ὄροφος
There is also another small shrine of Athena, but its roof has fallen in. There
κατερρύηκεν αὐτῷ. καὶ Ἡλίῳ ναὸς καὶ ἄλλος Χάρισιν, ὁ δὲ Σαράπιδι ᾠκοδόμηται
is a temple dedicated to Helios [Sun] and another to the Charites [Graces],
καὶ Ἴσιδι: καὶ περίβολοι μεγάλων λίθων λογάδων εἰσίν, ἐντὸς δὲ αὐτῶν ἱερὰ δρῶσιν
and one has been built for Sarapis and Isis. There are also enclosures of
ἀπόρρητα Δήμητρι.
large rough stones inside which they perform secret rites for Demeter.

2.34.9

Pausanias and truth

In Pausanias those scholars interested in the acquisition and explanation of old things could not avoid seeing a kindred spirit. Yet, in regarding Pausanias as a trustworthy witness, many scholars presume a mutual adherence to the same underlying grounds for truth, one based upon a very particular fidelity to the material world. By assuming a correlation between what is described in the text and what can be found on the ground, such assessments tended to tip Themis's scales more to the side of what, in this case, amounts to similarities rather than differences (see Stewart 2013). One could also see this as a matter of framing and mood. How should the text be read? Should one see it as dealing with antiquarian concerns, with loss and memory? Should it be understood as a religious pilgrimage (Elsner 1992; consider Arafat 1996, 9–11 on the implication of the word "pilgrim" and the preference for *pepaideumenos*)?

Pausanias, however, is a believer in a world where the grounds for a modern, propositional truth was undisclosed as such (Heidegger 2008). Thus, things cannot be assumed to reveal themselves to human perception on the same grounds. Pausanias is, to borrow again from Heidegger, a "receiver of beings" (2002, 68). As such, Pausanias is among others who are looked upon by the gods and the objects of the world that they experience. From these grounds, his predilection for the truth is less an issue of establishing authority (Hutton 2005, 15; Stewart 2013), and more a matter of religious conviction, less an issue of representation, in the narrow sense of having descriptions "stand for" something else and more a matter of apprehension, in the sense of seizing hold of something. The use of apprehension here also impels us to rethink the most basic grounds for truth and fidelity in our conceptions of space.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Selective fidelities

Pausanias gives the length of the peninsula as about 7 stades and width as no more than 3, at the widest (2.34.9). Never mind what has been lost to the rising sea, the measure given for width has been judged as inaccurate: "his maximum width [is] almost twice the 300 m it is today" (Jameson, Runnels and van Andel 1994, 584). Jameson treated the matter of measure as a problem of accuracy, understood in absolute rather than relative terms, based on a correspondence of measure to actual qualities of the peninsula, length and width. But we may also frame the supposed discrepancy as a difference in fidelity, that is, where its faith was placed.

Length may be gauged from the water or across the harbor, but width, the breadth of the peninsula may have been another matter for the otherwise trustworthy Pausanias. Perhaps his estimate is a reflection of the difficulties associated with obtaining bearings through a warren of meandrous streets, dictated by slope and structure. Perhaps his measure is derived from another account or grey matter recall in the course of compiling his narrative within the comforts of a distant room. Or, perhaps this measure, possibly derived from a local informant, was faithful to an altogether different spatiality, an idealized form based on the geometrical properties of ratio (3:7) and proportion (length = width x 2 + 1). Whatever the answer, to presume that the discrepancy is a simple mistake is to assume a semblance, an accordance, that rests on mutual grounds of truth and accuracy. This is to make demands that the text cannot fulfill, for truth is a matter of fidelity, and accuracy can only be understood in light of the purposes for which the *Periegesis* serves. Pausanias should not be judged through the conventions of a predetermined picture of the world.

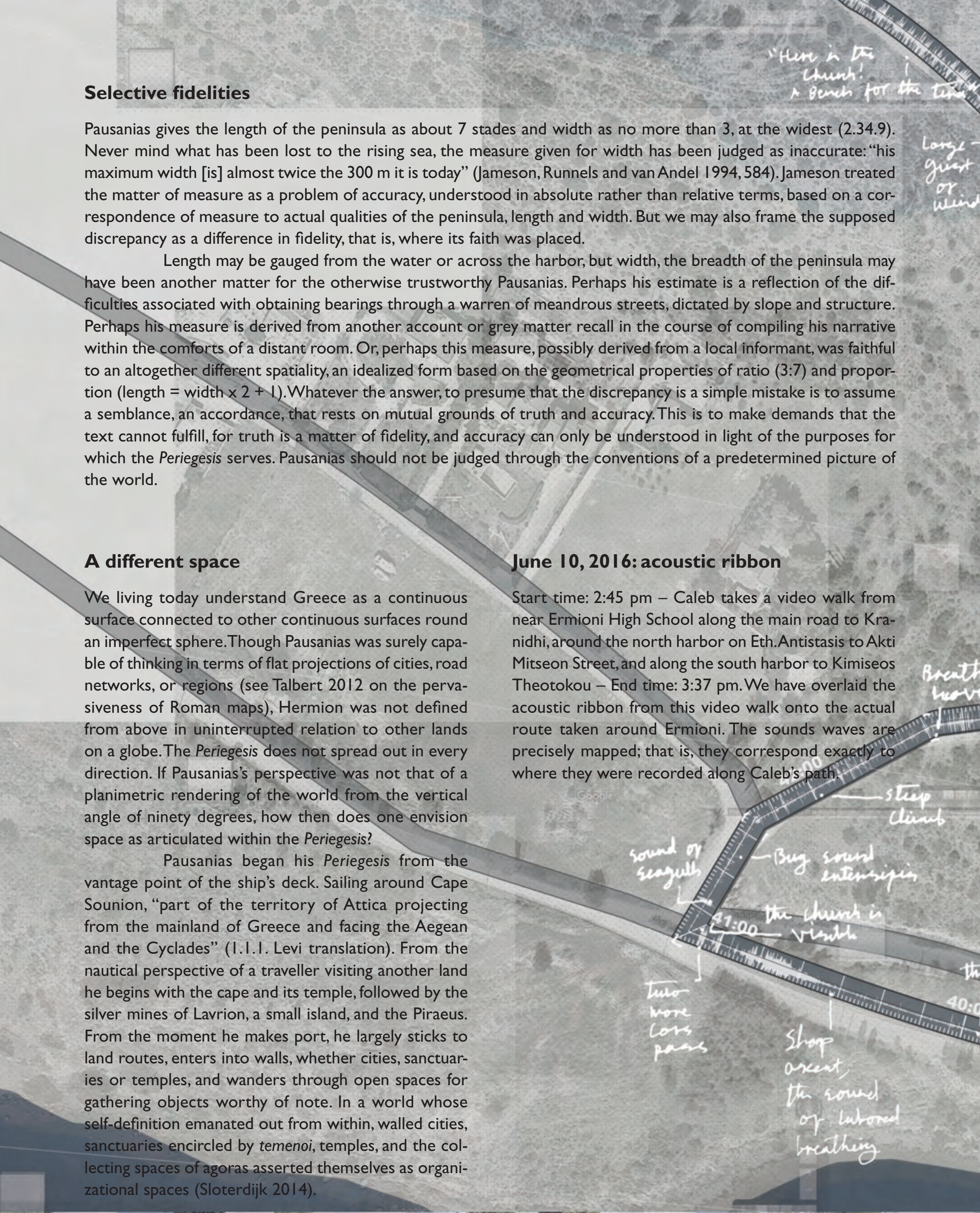
A different space

We living today understand Greece as a continuous surface connected to other continuous surfaces round an imperfect sphere. Though Pausanias was surely capable of thinking in terms of flat projections of cities, road networks, or regions (see Talbert 2012 on the pervasiveness of Roman maps), Hermion was not defined from above in uninterrupted relation to other lands on a globe. The *Periegesis* does not spread out in every direction. If Pausanias's perspective was not that of a planimetric rendering of the world from the vertical angle of ninety degrees, how then does one envision space as articulated within the *Periegesis*?

Pausanias began his *Periegesis* from the vantage point of the ship's deck. Sailing around Cape Sounion, "part of the territory of Attica projecting from the mainland of Greece and facing the Aegean and the Cyclades" (1.1.1. Levi translation). From the nautical perspective of a traveller visiting another land he begins with the cape and its temple, followed by the silver mines of Lavrion, a small island, and the Piraeus. From the moment he makes port, he largely sticks to land routes, enters into walls, whether cities, sanctuaries or temples, and wanders through open spaces for gathering objects worthy of note. In a world whose self-definition emanated out from within, walled cities, sanctuaries encircled by *temenoi*, temples, and the collecting spaces of agoras asserted themselves as organizational spaces (Sloterdijk 2014).

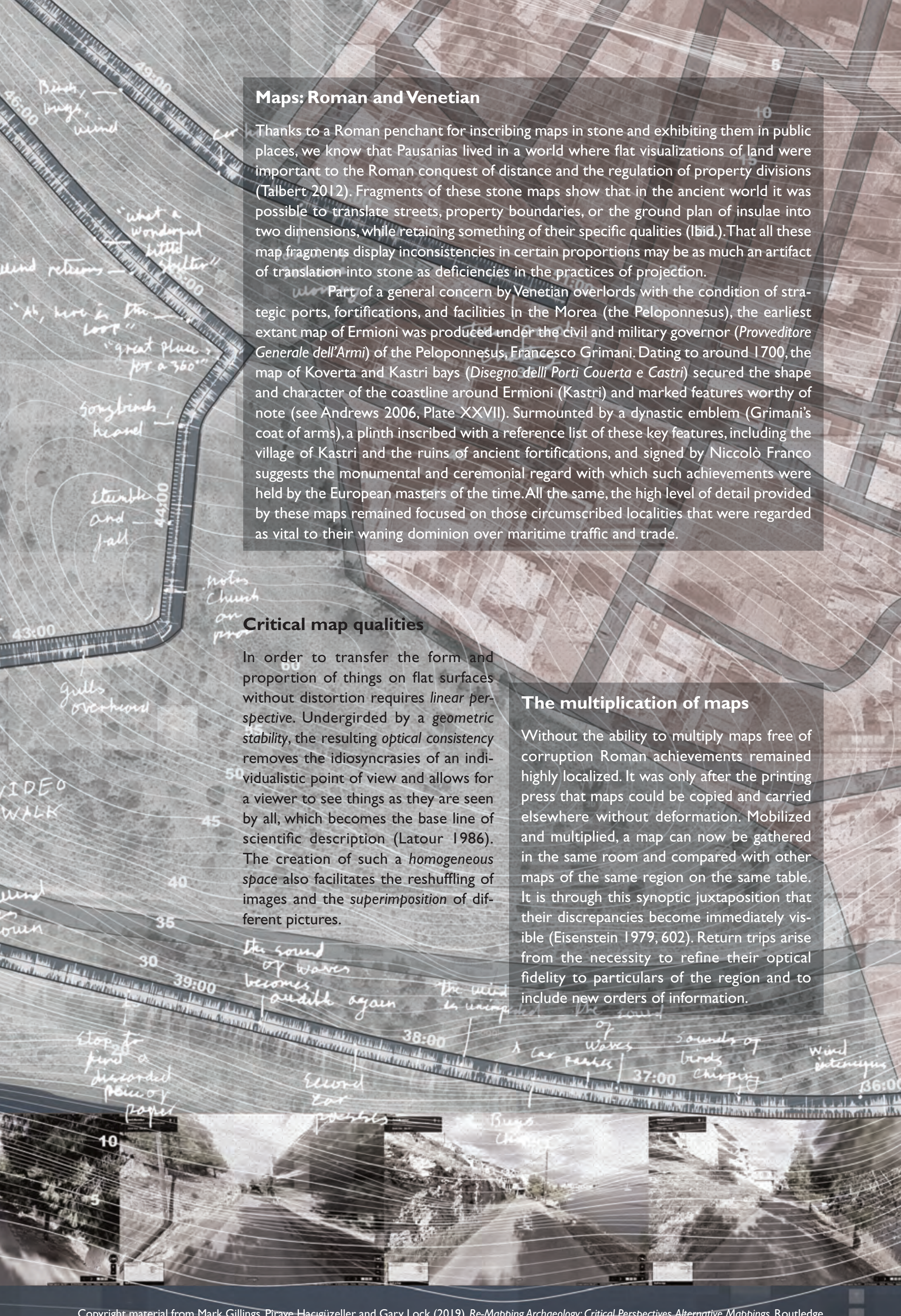
June 10, 2016: acoustic ribbon

Start time: 2:45 pm – Caleb takes a video walk from near Ermioni High School along the main road to Kranidhi, around the north harbor on Eth. Antistasis to Akti Mitseon Street, and along the south harbor to Kimiseos Theotokou – End time: 3:37 pm. We have overlaid the acoustic ribbon from this video walk onto the actual route taken around Ermioni. The sounds waves are precisely mapped; that is, they correspond exactly to where they were recorded along Caleb's path.



google street view

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge


49:00
46:00
Birds, bugs, wind
"what a wonderful little shelter"
wind returns
"Ah, here is the loop"
"great place for a 360"
Songbirds heard
Stumble and fall
44:00
notes Church on pro
43:00
gulls overhead
VIDEO WALK
wind down
39:00
the sound of waves becomes audible again
the wind is unimp
the sound of waves
Stop to find a discarded piece of paper
38:00
Second car passes
a car passes
37:00
sounds of birds chirping
Bugs chirping
Wind intensifies
36:00
5
10
15
60
50
45
40
35
30
10
5

Maps: Roman and Venetian

Thanks to a Roman penchant for inscribing maps in stone and exhibiting them in public places, we know that Pausanias lived in a world where flat visualizations of land were important to the Roman conquest of distance and the regulation of property divisions (Talbert 2012). Fragments of these stone maps show that in the ancient world it was possible to translate streets, property boundaries, or the ground plan of insulae into two dimensions, while retaining something of their specific qualities (Ibid.). That all these map fragments display inconsistencies in certain proportions may be as much an artifact of translation into stone as deficiencies in the practices of projection.

Part of a general concern by Venetian overlords with the condition of strategic ports, fortifications, and facilities in the Morea (the Peloponnesus), the earliest extant map of Ermioni was produced under the civil and military governor (*Provveditore Generale dell'Armi*) of the Peloponnesus, Francesco Grimani. Dating to around 1700, the map of Koverta and Kastri bays (*Disegno delli Porti Couerta e Castri*) secured the shape and character of the coastline around Ermioni (Kastri) and marked features worthy of note (see Andrews 2006, Plate XXVII). Surmounted by a dynastic emblem (Grimani's coat of arms), a plinth inscribed with a reference list of these key features, including the village of Kastri and the ruins of ancient fortifications, and signed by Niccolò Franco suggests the monumental and ceremonial regard with which such achievements were held by the European masters of the time. All the same, the high level of detail provided by these maps remained focused on those circumscribed localities that were regarded as vital to their waning dominion over maritime traffic and trade.

Critical map qualities

In order to transfer the form and proportion of things on flat surfaces without distortion requires *linear perspective*. Undergirded by a *geometric stability*, the resulting *optical consistency* removes the idiosyncrasies of an individualistic point of view and allows for a viewer to see things as they are seen by all, which becomes the base line of scientific description (Latour 1986). The creation of such a *homogeneous space* also facilitates the reshuffling of images and the *superimposition* of different pictures.

The multiplication of maps

Without the ability to multiply maps free of corruption Roman achievements remained highly localized. It was only after the printing press that maps could be copied and carried elsewhere without deformation. Mobilized and multiplied, a map can now be gathered in the same room and compared with other maps of the same region on the same table. It is through this synoptic juxtaposition that their discrepancies become immediately visible (Eisenstein 1979, 602). Return trips arise from the necessity to refine their optical fidelity to particulars of the region and to include new orders of information.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

playground
workshop
video 2
ends 3:29
June 10th
33:00
1:05

notes from journey
on June 10th

A change in sight

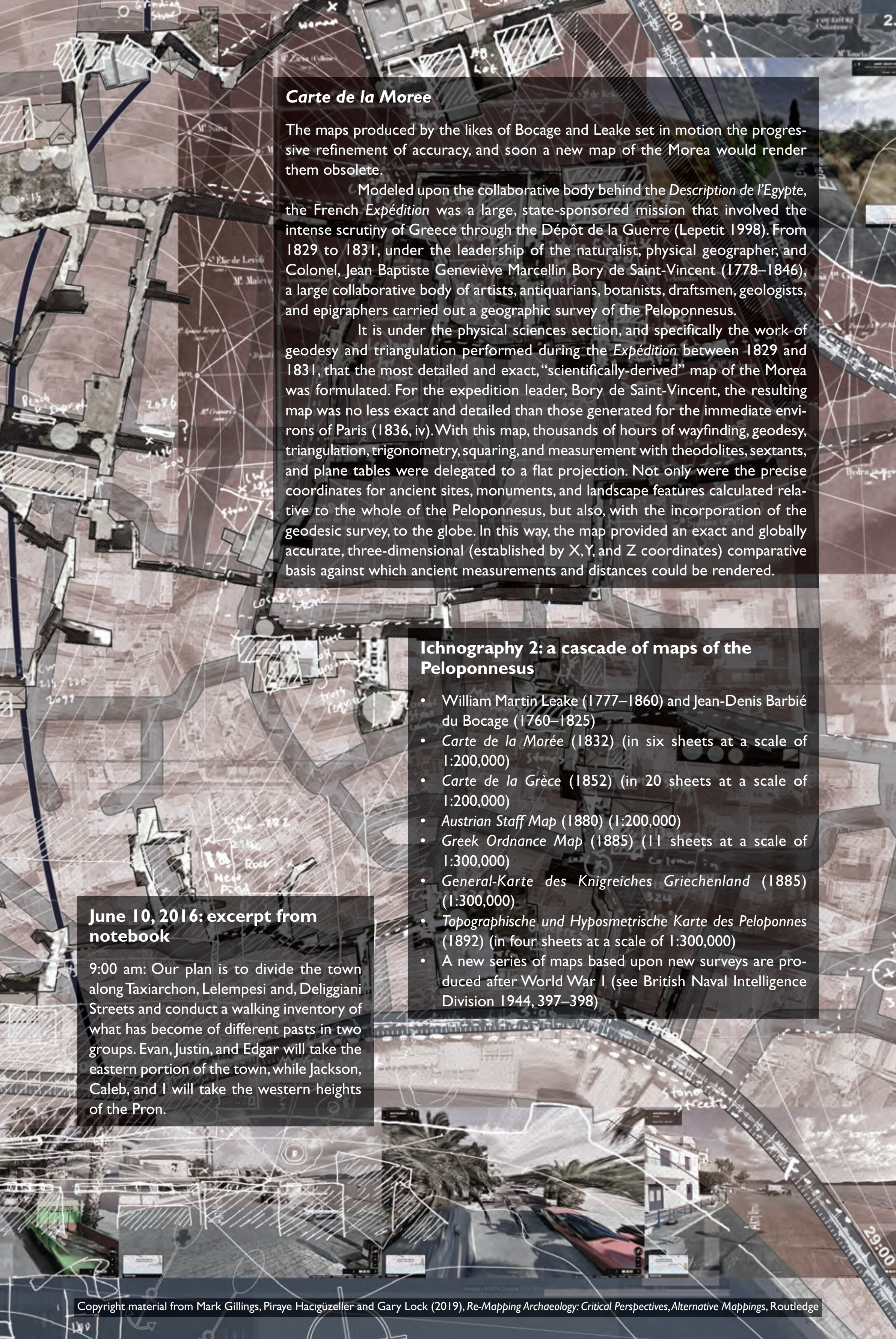
Pausanias's spatiality was "to be read" (*ut legitur*) rather than "looked at" (*spectandus*), but *how* one looked at ancient maps is very different from how we look at modern ones. Given our purposes, here we emphasize a profound change in how maps redefine "what it is to see and what there is to see" (Latour 1986, 9). In the late eighteenth and early nineteenth centuries Northern Europeans met the challenge of how to secure a trustworthy picture of the face of Greek lands with a different cartographic assemblage (Witmore 2013).

All eighteenth-century maps encompassing the whole of the Peloponnesus were derived from Admiralty surveys, thus information concerning the interior of the region remained in question. By the time that the rival cartographers Jean-Denis Barbié du Bocage (1760–1825) and William Martin Leake (1777–1860) were dispatched to measure the interior of the Peloponnesus for the purposes of producing accurate maps, those flat projections could manifest the exact path of roads, the precise course of streams, the specific shape of distant valleys, the heights of mountain passes, and the character of coastlines with their hazards and safe harbors. While, Roman surveyors and ancient mapmakers enrolled similar modes of projection, the numerous innovations in instruments – sextants, theodolites, measuring chains – and practices – note taking and notebooks with tabulations of bearings and distances, and triangulation – make a difference. Another key difference was that the maps of Bocage and Leake could not only capture the internal qualities of infrastructures and landforms without distortion, they could also be multiplied many times over without fear of corruption (Latour 1986). In this way, these maps overcame distance to a degree that ancient maps never could, and over the course of many return trips, maps could be refined with the addition of new details. Combined with descriptive geographies, which included illustrations, maps became a primary visual mode for securing observations. These visualizations not only changed the way that military personnel or Classical topographers looked at places both from a distance and up close, but also how they understood them.

Intensities

Maps and satellite imagery are the outcome of a long process of making latent qualities explicit from above. There are gains and losses here. We gain in our ability to contemplate something of Ermioni while sitting in a comfortable chair many thousands of kilometers away. Yet, in walking on Latsou Street without access to any digital device or a map, I am unaware of rooftops, inner courtyards, gardens behind high walls, elevated terraces, or the network of streets on the other side of the line of houses to the west. Just as Pausanias did not see rooftops from above, we have tried to convey a sense of the effective disposition of walking a street through different intensities of visual information. Those things that can be seen along the street are seen from above, those things that do not are left to obscurity.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge



Carte de la Moree

The maps produced by the likes of Bocage and Leake set in motion the progressive refinement of accuracy, and soon a new map of the Morea would render them obsolete.

Modeled upon the collaborative body behind the *Description de l'Egypte*, the French *Expédition* was a large, state-sponsored mission that involved the intense scrutiny of Greece through the Dépôt de la Guerre (Lepetit 1998). From 1829 to 1831, under the leadership of the naturalist, physical geographer, and Colonel, Jean Baptiste Geneviève Marcellin Bory de Saint-Vincent (1778–1846), a large collaborative body of artists, antiquarians, botanists, draftsmen, geologists, and epigraphers carried out a geographic survey of the Peloponnesus.

It is under the physical sciences section, and specifically the work of geodesy and triangulation performed during the *Expédition* between 1829 and 1831, that the most detailed and exact, "scientifically-derived" map of the Morea was formulated. For the expedition leader, Bory de Saint-Vincent, the resulting map was no less exact and detailed than those generated for the immediate environs of Paris (1836, iv). With this map, thousands of hours of wayfinding, geodesy, triangulation, trigonometry, squaring, and measurement with theodolites, sextants, and plane tables were delegated to a flat projection. Not only were the precise coordinates for ancient sites, monuments, and landscape features calculated relative to the whole of the Peloponnesus, but also, with the incorporation of the geodesic survey, to the globe. In this way, the map provided an exact and globally accurate, three-dimensional (established by X, Y, and Z coordinates) comparative basis against which ancient measurements and distances could be rendered.

Ichnography 2: a cascade of maps of the Peloponnesus

- William Martin Leake (1777–1860) and Jean-Denis Barbié du Bocage (1760–1825)
- *Carte de la Morée* (1832) (in six sheets at a scale of 1:200,000)
- *Carte de la Grèce* (1852) (in 20 sheets at a scale of 1:200,000)
- *Austrian Staff Map* (1880) (1:200,000)
- *Greek Ordnance Map* (1885) (11 sheets at a scale of 1:300,000)
- *General-Karte des Knigreiches Griechenland* (1885) (1:300,000)
- *Topographische und Hyposmetrische Karte des Peloponnes* (1892) (in four sheets at a scale of 1:300,000)
- A new series of maps based upon new surveys are produced after World War I (see British Naval Intelligence Division 1944, 397–398)

June 10, 2016: excerpt from notebook

9:00 am: Our plan is to divide the town along Taxiarchon, Lelempesi and, Deliggiani Streets and conduct a walking inventory of what has become of different pasts in two groups. Evan, Justin, and Edgar will take the eastern portion of the town, while Jackson, Caleb, and I will take the western heights of the Pron.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Ermioni - Poros
Ερμιόνη - Πειραιάς
F.R.2M
Dolphin ferry to Athens
68 ft
3
5
4
15:00
Recent Hom
Hotels, c
older stone tile
tourism map
Recent building
cement
10
15
Recent building
Newer Home
Newer apartments
Vacant building for sale
ΔΗΜΟΤΙΚΗ
* vacant area w/ small bits of ancient material (column, small altar?) see photo
basillica (Jameson)

Increasing scale

By the late nineteenth century the inconsistencies in the maps based upon the French survey of the Morea (1829–1831) became too great to be corrected by wrestling with its constraints in the resulting projections. Still, there is far more to multiplying the scales of maps than matters of precision. At scales of 1:25,000, 1:10,000, and 1:5000, maps could be used for land registers, planning of public or private works, securing names to any and all locations, or backcountry trekking. Thus, with a variety of scales one confronts the combination of the expansion of the map to capture the most minute of details, and the pervasiveness of the two-dimensional extended into every domain. What had been the most powerful articulation of power possible in the early nineteenth century (Latour 1986; Driver 2001) would now infiltrate all aspects of life.

A new Geodetic Mission (*Geodaitikí Apostolí*) is initiated in 1889. What begins as an Austrian Military Mission under the direction of Lieutenant Colonel Heinrich Hartl would become a Greek military endeavor in 1895 – renamed in 1926 as the Hellenic Military Geographical Service (British Naval Intelligence Division 1944) – thus ending the history of Northern European control over the mapping, demarcating, and naming of localities Greek. Over the course of many decades, a new infrastructural base would be established on the basis of a new cycle of survey, geodesy, and triangulation. Whereas the French Map was based upon 183 principle points for triangulation for the Peloponnesus and the surrounding islands (Peytier, Puillion-Boblay and Servier 1833, 102–106), the HMGS would establish 26,739 (first and second order) trigonometric control points over the whole of Greece (see HMGS website: http://web.gys.gr/). A new chain of production is initiated by the HMGS and the data produced will undergird the maps used by EuroGeographics (www.eurogeographics.org), the company that provides the source maps for Greece in Google Maps (http://maps.google.com/).

Flattening an ellipsoid

Ever since Gerardus Mercator introduced his projection in 1569, it has been understood that the translation of a sphere into a cylinder preserves local angles around points at the expense of the distortion of area, which expands in extent towards the poles (see Battersby et al. 2014). Nearly all digital-map providers – Bing Maps, ESRI, Google Maps, Mapquest, Mapbox, OpenStreetMaps, etc. – enroll a variant of Mercator's projection known as "Web Mercator." While Web Mercator maps our imperfect ellipsoid onto a sphere in order to simplify calculations, the visual difference between the two projections is imperceptible to the naked eye. The gains of this digital projection are to be found in the economy of computing power, the consistency of local angles, and orientation; north is always up. The losses result not in navigation but in mapping, with an increasing lack of fidelity to the area of a region as one moves towards the poles.

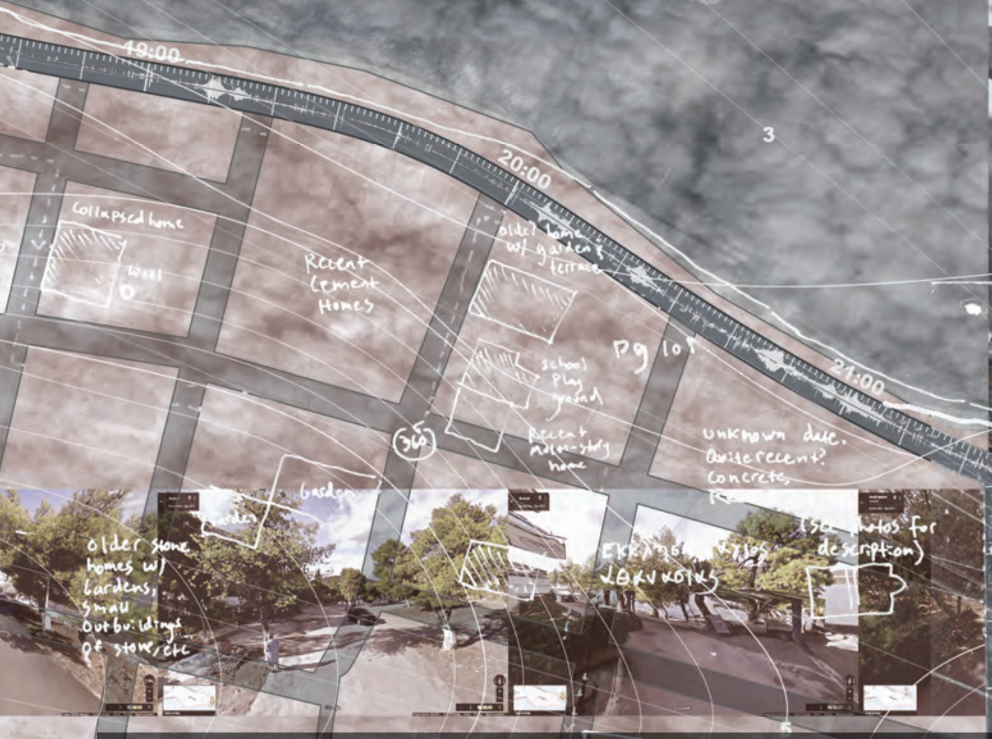
Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Reshuffling scales

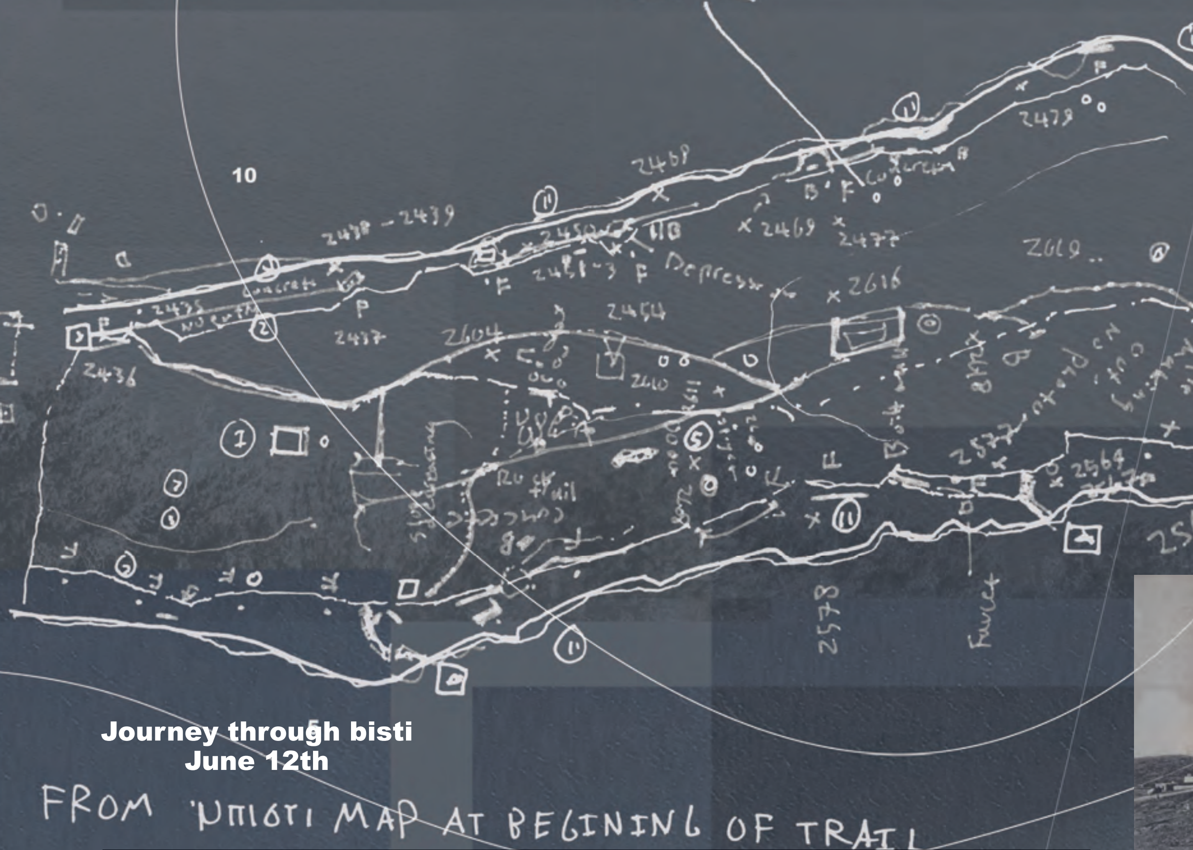
What over the course of the twentieth century, what always had been determined in advance solely by the mapmaker, can now be determined with one click of the + or – zoom in Google Maps. Should you wish, you may zoom out to a distance of several thousand kilometers or leave the map entirely to observe the blue marble of earth from space. Whereas, shuffling between scales was anything but smooth on paper, zoom now pulls of the trick of revealing maps as continuous, unbroken surfaces between the astronautical and the nautical, the extraterrestrial and the terrestrial.

Fungibility

Click through base cartography and satellite photography; click through different scales; click from 2D to 3D and shift angles, overlay more layers of information – a trick of Google Maps is tied to an expectation of effective alignment. Fungibility is enrolled here in an expanded sense, lacking in an exclusively economic definition of mutually substitutable units, to refer to the ability to superimpose and combine different pictures because they maintain the same perspectives, orientations, angles, and scale. A stable, homogeneous base line results from optical consistency and allows for elements on different pictures to be aligned and reshuffled, much like a deck of playing cards. Thus, we encounter a consistent path through different layers of information.


19:00
20:00
21:00
3
Collapsed home
Well
Recent Cement Homes
older home w/ garden & terrace
school Play ground
Pg 10
360
Recent multi-story home
unknown date. Quite recent? Concrete,
garden
garden
older stone homes w/ gardens, small outbuildings of stone, etc
(see photos for description)
5

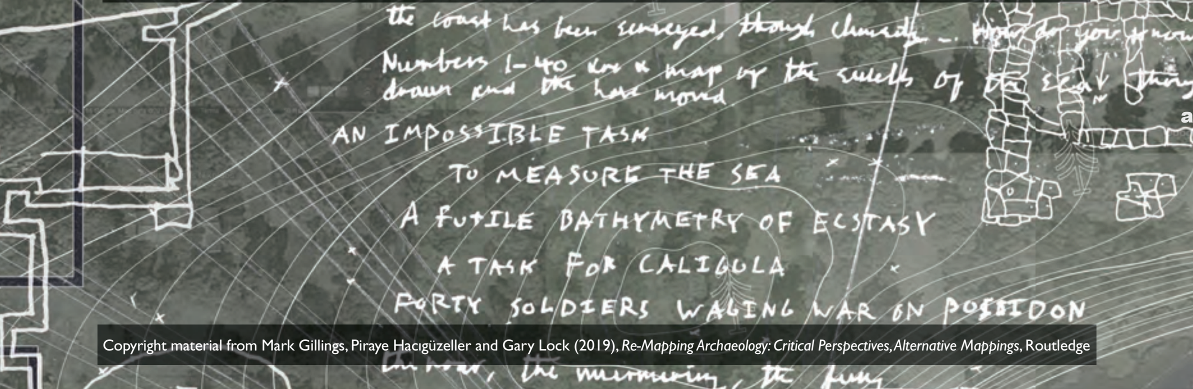
Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge


10
Journey through bisti
June 12th
FROM 'ΥΠΙΟΤΙ MAP AT BEGINING OF TRAIL
Ancient Mole

Pixels and paper

Just as Pausanias was writing in the midst of a changeover to a new medium, so do we. Consider the engagement with an interface, flipping pages versus fingertip operations. When comparing maps in paper to digital formats, the former is now regularly judged from the angle of its limitations in comparison to the latter, which is now more pervasive. One cannot break through the ink frames of the paper map and finger their way to a different section of the coast or continuously pan in any direction. One cannot seamlessly zoom in to any location, or out to view the world map as a whole or, in melding map and globe in a single click, the blue marble of earth (one can spin the orb to a desired point with more mastery and skill than Atlas, the geographer holding the globe at the center of Mercator's frontispiece to his great *Atlas*). Neither can one tilt to an oblique view, shift into three-dimensionality while breaking with a north-up configuration to observe an object, such as Ermioni, from different angles. One cannot modify what is shown with different layers of information. Nor can one drop to the ground and advance along Akti Mitseon Street while the image refreshes constantly. What is to be found here, in this book, becomes explicit as the frozen image, solidified as if it was placed under Medusa's gaze.

If we consider the gains of the paper-based book, then it holds information without the need for constant curation and it offers a different form of engagement from a screen interface. If we consider this matter in terms of a comparison of storage capacity, then the 20 petabytes of imagery – satellite imagery, aerial photograph, map data, Street Views – offered through Google Maps and Google Earth equates to 10 trillion pages of printed text (based on a common rule of thumb that 1 petabyte equates to 500 billion pages; see Brotton 2012, 407). Paper maps have become one optional output of many.


THE IMPOSSIBILITY OF KNOWLEDGE
the coast has been surveyed, though clumsily – How do you know
Numbers 1–40 are a map by the smells of the sea
drawn and they have moved
AN IMPOSSIBLE TASK
TO MEASURE THE SEA
A FUTILE BATHYMETRY OF ECSTASY
A TASK FOR CALIGULA
FORTY SOLDIERS WAGING WAR ON POSEIDON

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Pg. 99
ΤΩΝ ΕΡΜΙΟΝΕΩΝ ΠΟΛΙΣ
ΤΕΙΧΟ
ΜΥΛΟΣ
Ak Kastri
Fl.1 5s4m
20
i 1941
ent temple
ameson)

"Neogeography"

Now, everyone is a cartographer. Through digital mapping services, maps are freely available, user-centered, malleable, participatory, and, with the ability to generate idiosyncratic maps, personalized. Control your information either by using a free application programing interface (API) and importing GeoJSON data or by annotating information directly in digital mapping packages. Suggest edits to names or locations. Add labels, business names, or photos. Anyone can now build their own maps (Turner 2006; for a critical assessment in archaeology, see Myers 2010). Of course, there is far more to this "neogeography" than an engagement with a flat screen on a desk. With a variety of handheld devices new modes of association and ubiquitous engagement open up. All totaled, this suggests a cartography blown free of its imperial moorings and opened to a more democratic distribution of power.

This "neogeography" is powerful, yes, and selective. Digital maps are now an obligatory passage point; begin here for all spatially relevant situations from navigation to mapmaking. With Google Maps on screen, space is centrifugal, in that it radiates out from the connected self, whose geolocation is known. Heidegger's point that man is at center (2002, 69–70) begins to take on new meaning when from the opening of the page the self is located at the center. This new mapmaker's space redefines everything on new, yet, strangely, all too familiar grounds.

Excerpt on Bisti

J.G. (informant):
"Because it is a forest, an archaeological site, and it belongs to the municipality, there are three authorities in charge of the park. If one of the authorities attempts to undertake a project the other two always object. Ermionians love the park. It is their favorite part of town. The trees, which make for peaceful strolls were planted there before World War II and some of the people who did this are alive still. The park is cleaned up every year by the local scouts who camp there. Nothing should be done to change it. It should only have fire protection and, from an archaeological point of view, it should have informational signs for those who come to walk or swim."
Excerpt from an interview conducted with a local tavern owner at 11:30am on August 17, 2003 in the Taberna Philoxenia, Ermioni.

Map: the black box

Paper maps have a way of subduing the fact that they are achievements, if only because they circulate as the end point of a whole chain of transformation that they do not carry around with them. Still, if the trials and tribulations that led to the *telos* of the map were forgotten, that is because it had risen to a new level of association where one was not reminded of the ever-present need for acquisition and refinement – many early maps were further strengthened by an accompanying publication that described their production, including details of triangulation and geodesy, specific instruments and personnel (consider the *Carte de la Moree* and Peytier, Puillion-Boblay and Servier 1833). It is no less the case today, and it is only because digital mapping services are constantly updating their platforms with new features and information, that we are reminded of the fleets, satellites, service providers, servers, and networks that give rise to them (also see November, Camacho-Hübner and Latour 2010). The point is that this practical activity is not dropped in favor of the end result, but manifested in some way.

Ground Truth

Refining the accuracy of services, such as Google Maps, is a constant. For effective real time navigation streets, intersections, and traffic signs need to be in alignment. The alignment of these features is worked out through a combination of algorithms and manual operations using satellite, aerial, and Street View imagery in a project known as Ground Truth (Miller 2014). While Ground Truth involves the acquisition of new data on the ground – a fleet of vehicles, trolleys, and backpacks acquire footage against which to further refine the accuracy of maps – unlike the more familiar archaeological notion of ground truthing, where the content of imagery is compared to what exists in a field or along a path, the accuracy of imagery is verified through an engagement with more imagery. While neither map nor satellite imagery holds complete dominance, their shared perspective, grounded in the scenography, wins out. However, the difference between maps, refined over hundreds of years of groundwork, and satellite imagery, acquired by a constellation of high-resolution satellites, legions of computers, and hundreds of engineers and technicians tied to imagery providers (DigitalGlobe and GeoEye for Google Earth) is tremendous (Latour 2004).

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

vertical panorama taken from boat
8/6/2007
10/30/2012
2016
8/6/2007
11/21/2013
4/29/2013
500 M
HMA

Thinking mimetically

To think mimetically is to confuse space with what is manifest on flat-surfaces, whether paper or screens (November, Camacho-Hübner and Latour 2010; Shanks and Webmoor 2013). In thinking through the mapmaker's space, two endpoints are simultaneously defined: 1) the virtual image with the map augmented by satellite imagery; and 2) the object of concern now defined as the prototype of the virtual, despite all the other qualities, affordances and possibilities it offers. The mimetic focuses on the resemblance between the physical object and its virtual image. Thus, the mimetic is tied to how archaeological and architectural features are "seen." What gets mapped is what is taken as a base reality, as objective grounds for the question of how to best mobilize objects of archaeological or architectural concern. The mimetic remains at the level of the scenography in contrast to the ichnography, which inserts the image into a cascade of precedent and antecedent forms. The mimetic is closely tied to the issues of precision and accuracy as well as purification and othering.

Conversation with informant (2014)

"Forget the map." He hands back my printout of the relevant section of the town map. "It is nonsense." He begins to walk toward Taxiarchon Street and waves for us to follow. "Accompany me and I will show you the house with the mosaic. It is just beyond the bakery. When you smell the sweet aroma of koulourakia (a buttery-pastry), the house will not be far."

Grounded with a habit memory of his hometown, shaped through the prolonged repetition of experiences over a lifetime, he had no need for the map. But it was not that the map made *no* sense to him, or that he could not tell us the way. While it is the case that the warren of streets renders the map somewhat less than useful, the tavern owner's point was to forego the indexical relation, forget the navigational utility of the map, and get to know a place through its textures, by engaging with those who live here.

What cannot be conveyed

Phenomenology has long called our attention to what cannot be conveyed in two dimensions. To ask what uncompressible attributes fall through the sieve of visual translation is to highlight the hegemonic powers maps have as the point of embarkation for all spatially relevant questions. While the 'return of space', was hardly balanced in its praise for maps – they both reduce and amplify – one cannot deny the complete impoverishment of place that occurs when one has to repeat the mantra, given expression by Borges's parable of a cartography that reached a point for point perfection between map and Empire (1972), that the map is not the territory.

Whatever odorless visualizations we concoct; whatever tasteless words we enroll to convey what is given over in experience, the very difference should betray a lack of resemblance between the thing and what is manifest in two dimensions. Only certain qualities are amplified while the others are left to their locality, their own circumstances. This *appears* to be changing. The hidden interiors of buildings or boats, canopied tables in tavernas, and the kinetics of all involved in the spaces of the town; the acoustics of streets saturated with music blaring through speakers and news broadcasts on televisions, conversations, laughter, and shouting; matters of contention, uncertainty, and even time past (Google Maps rolled out "Your Timeline," an archive of every path you have taken, in 2015), these things become explicit through the looking glass of the image, and digital mapping services are changing to accommodate them. The world picture is expanding.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

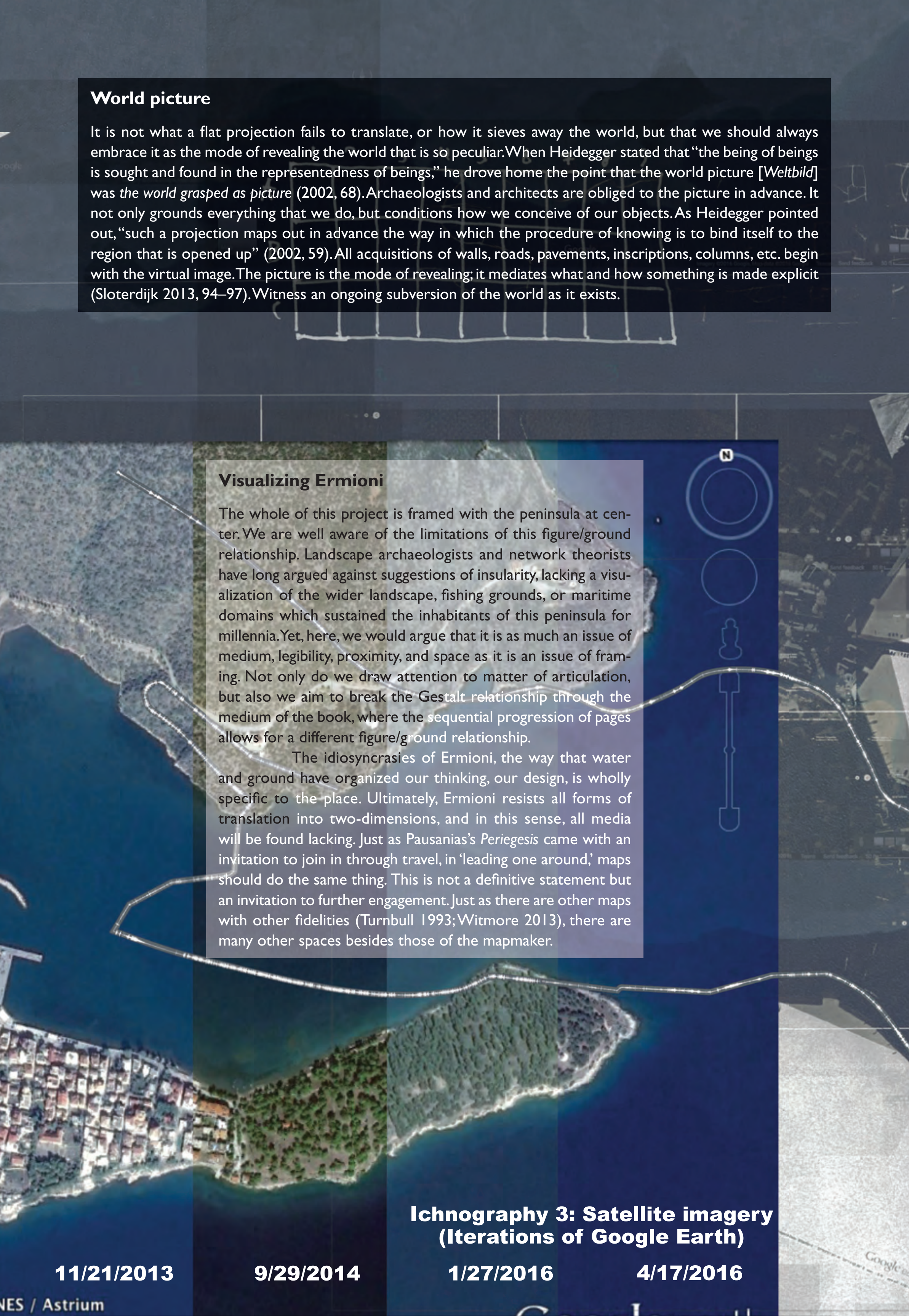
World picture

It is not what a flat projection fails to translate, or how it sieves away the world, but that we should always embrace it as the mode of revealing the world that is so peculiar. When Heidegger stated that "the being of beings is sought and found in the representedness of beings," he drove home the point that the world picture [*Weltbild*] was *the world grasped as picture* (2002, 68). Archaeologists and architects are obliged to the picture in advance. It not only grounds everything that we do, but conditions how we conceive of our objects. As Heidegger pointed out, "such a projection maps out in advance the way in which the procedure of knowing is to bind itself to the region that is opened up" (2002, 59). All acquisitions of walls, roads, pavements, inscriptions, columns, etc. begin with the virtual image. The picture is the mode of revealing; it mediates what and how something is made explicit (Sloterdijk 2013, 94–97). Witness an ongoing subversion of the world as it exists.

Visualizing Ermioni

The whole of this project is framed with the peninsula at center. We are well aware of the limitations of this figure/ground relationship. Landscape archaeologists and network theorists have long argued against suggestions of insularity, lacking a visualization of the wider landscape, fishing grounds, or maritime domains which sustained the inhabitants of this peninsula for millennia. Yet, here, we would argue that it is as much an issue of medium, legibility, proximity, and space as it is an issue of framing. Not only do we draw attention to matter of articulation, but also we aim to break the Gestalt relationship through the medium of the book, where the sequential progression of pages allows for a different figure/ground relationship.

The idiosyncrasies of Ermioni, the way that water and ground have organized our thinking, our design, is wholly specific to the place. Ultimately, Ermioni resists all forms of translation into two-dimensions, and in this sense, all media will be found lacking. Just as Pausanias's *Periegesis* came with an invitation to join in through travel, in 'leading one around,' maps should do the same thing. This is not a definitive statement but an invitation to further engagement. Just as there are other maps with other fidelities (Turnbull 1993; Witmore 2013), there are many other spaces besides those of the mapmaker.



Ichnography 3: Satellite imagery (Iterations of Google Earth)

11/21/2013 **9/29/2014** **1/27/2016** **4/17/2016**

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

20 M
40 M
120 M
200 M

A neutral background

Unless a grove or spring or enclosure along the way was infused by the divine or saturated with potent histories, traversed space held very little importance for Pausanias. And why should anyone expect it to? It is only within a "homogeneous, arbitrarily divisible representational space," as Sloterdijk points out, that "all points are of equal value" (2013, 27). One could say the same for coordinates in time. Whether a rationale is sought in terms of nostalgia (Alcock 1993, 27–29) or patriotism (Habicht 1985, 104) a neutral perspective is always in the background for those who place as much emphasis on what Pausanias fails to mention as on what he finds noteworthy. In an age before the world as picture became explicit, not all spaces were accorded equal interest. Some locales were more potent than others. Some valleys were more favored by the gods; some caves were more hospitable to nymphs; some roads were more haunted by ghosts.

A mashup

The mashup of satellite imagery that provides the base layer for this project is a modest collage of nearly 400 screen shots from Google Maps. As a whole, such a project is often regarded as an end product within a long process of translation, moving between the material world and a definitive document. Our chapter, however, is but a step in an ongoing process. The palimpsestial nature of this project should be read as an invitation to others to sketch paths, record disagreements, as marginalia in the book or additions on the overall plan. Even in the world of paper, a map may aspire to be a conversation.

Modes of engagement

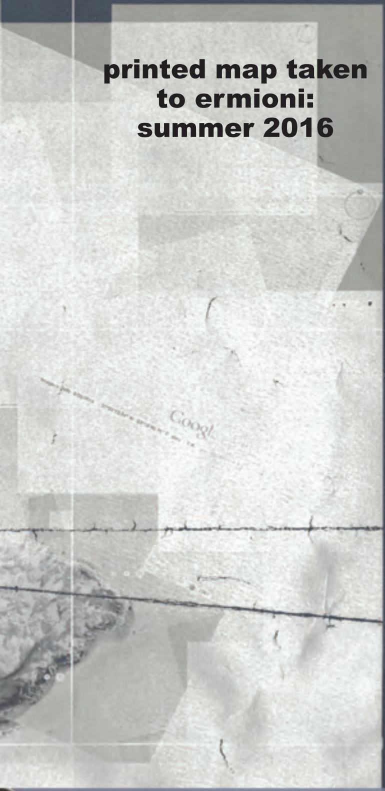
Media permit and shape, they amplify and restrain the character and form of association and action. Just as the Aldine Press *duodecimo* version of the *Periegesis* shaped antiquarian engagements on the ground in Greece, so too do maps impact how archaeologists survey the region of the Southern Argolid (see Jameson, Runnels and van Andel 1994) or how tourists move along streets in Ermioni.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

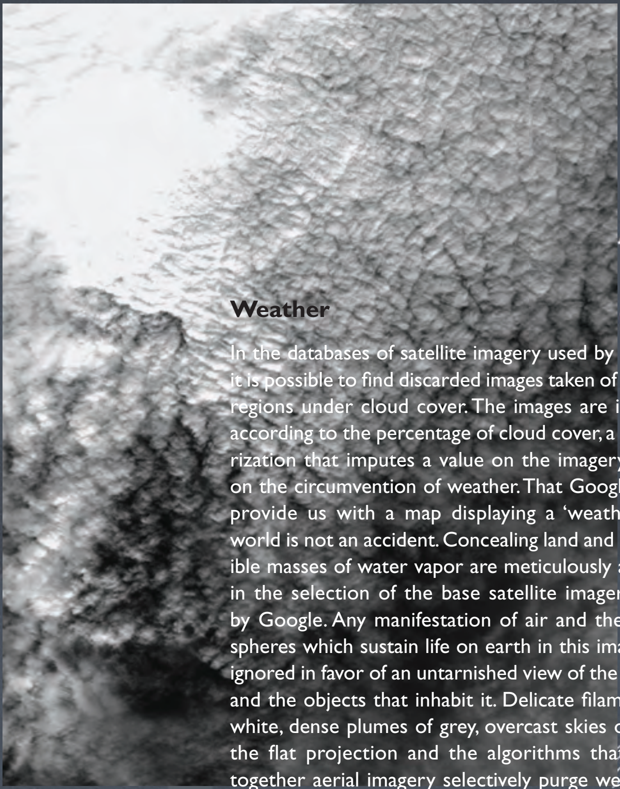
A betrayal of scenography

Just as the warren of streets challenges the navigational utility of the map on the ground, we have chosen to break with those mimetic qualities that make maps so necessary. Through a betrayal of scenography, which undergirds our fields of endeavor (Serres 1995; Witmore 2009), we hope to open up different spaces and practices.

Construction
3446-3466
Late
Dog young
crazy

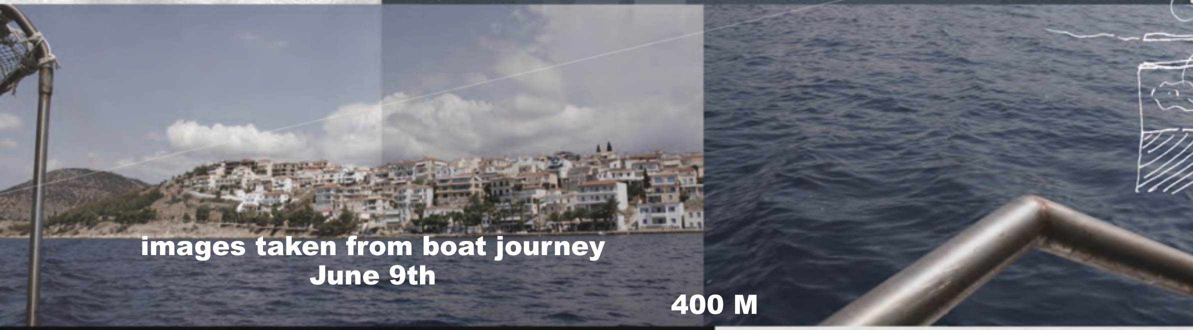


printed map taken to ermioni: summer 2016



Weather

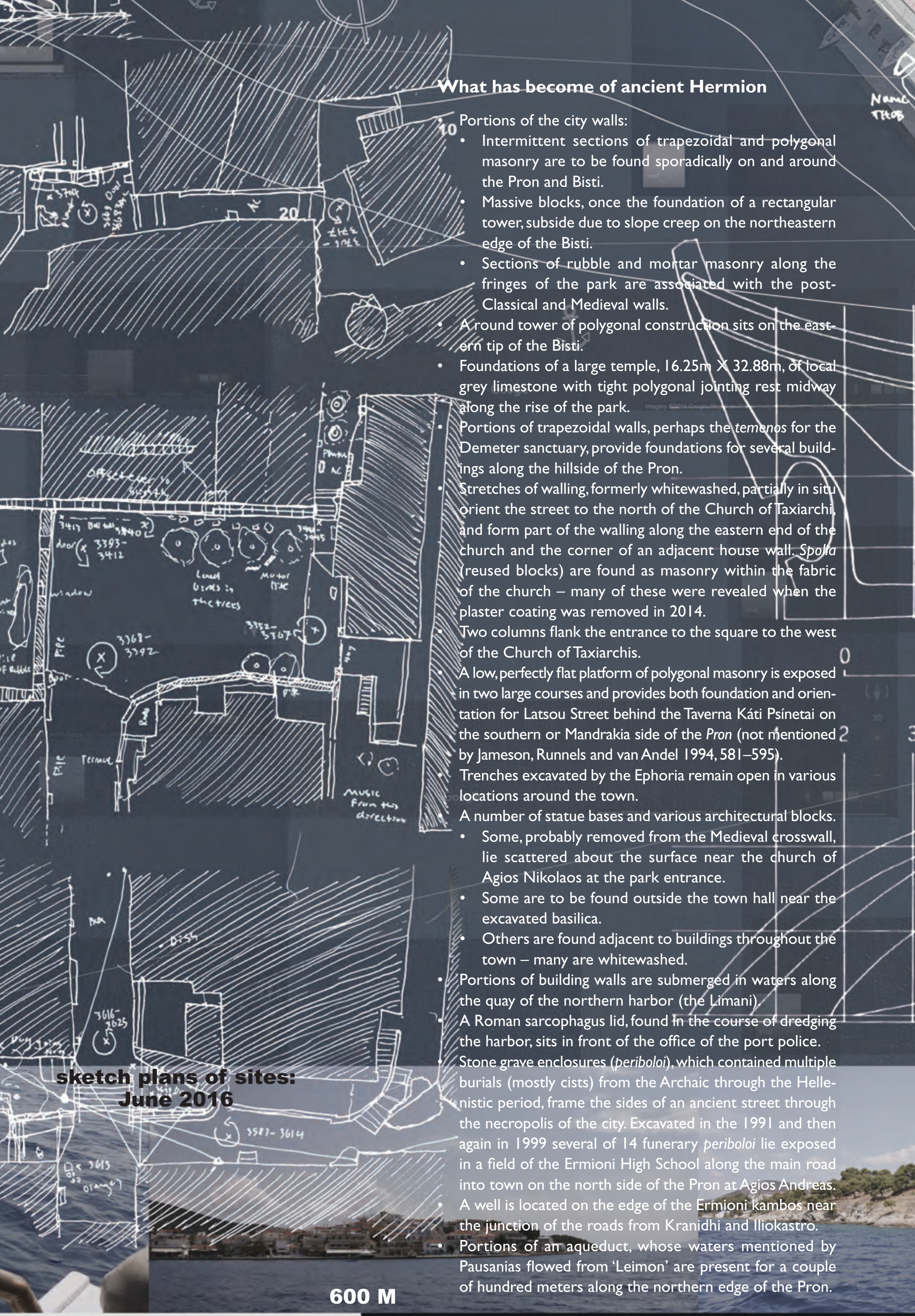
In the databases of satellite imagery used by Google it is possible to find discarded images taken of various regions under cloud cover. The images are indexed according to the percentage of cloud cover, a categorization that imputes a value on the imagery based on the circumvention of weather. That Google Maps provide us with a map displaying a 'weather-less' world is not an accident. Concealing land and sea, visible masses of water vapor are meticulously avoided in the selection of the base satellite imagery used by Google. Any manifestation of air and the atmospheres which sustain life on earth in this imagery is ignored in favor of an untarnished view of the ground and the objects that inhabit it. Delicate filaments of white, dense plumes of grey, overcast skies obscure the flat projection and the algorithms that stitch together aerial imagery selectively purge weather – foreground noise. Google Earth's depiction of the world is founded on the absence of clouds, fog, and moisture-laden atmospheres. An aftereffect of such filtering is not only that the viewer is conditioned to forget the weather, but also that any engagements with the weather-world no longer seem to be generative of space.



images taken from boat journey June 9th

400 M

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge



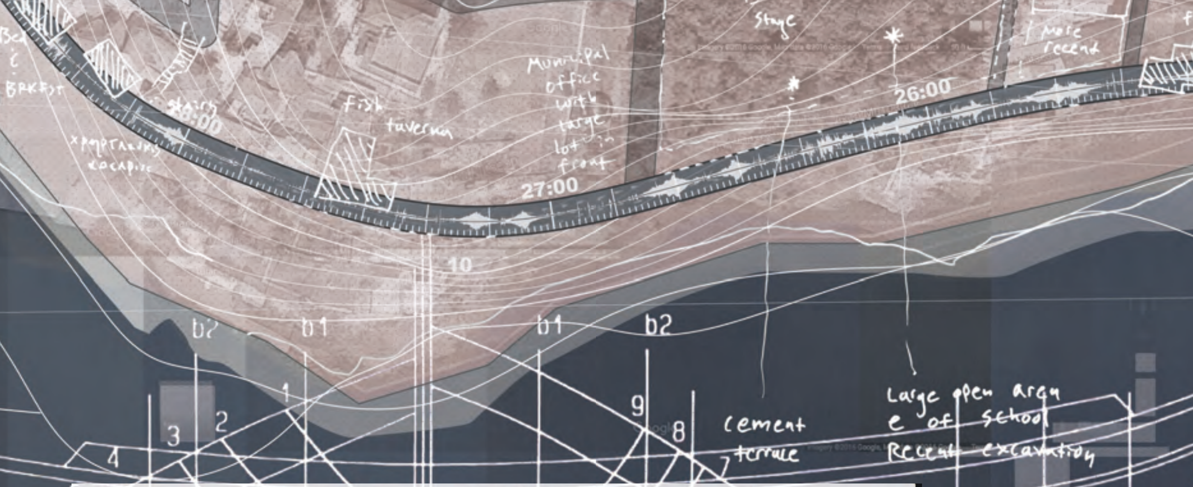
What has become of ancient Hermion

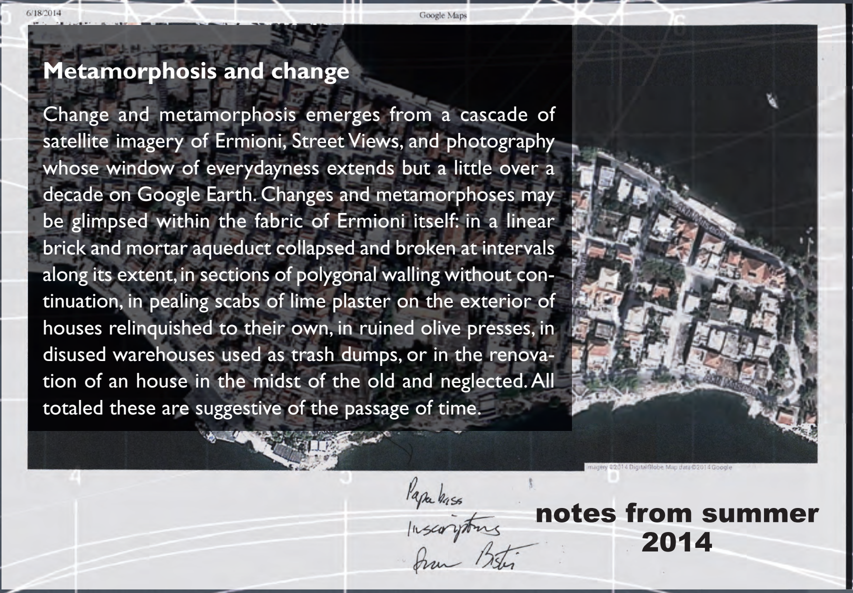
- Portions of the city walls:
  - Intermittent sections of trapezoidal and polygonal masonry are to be found sporadically on and around the Pron and Bisti.
  - Massive blocks, once the foundation of a rectangular tower, subside due to slope creep on the northeastern edge of the Bisti.
  - Sections of rubble and mortar masonry along the fringes of the park are associated with the post-Classical and Medieval walls.
- A round tower of polygonal construction sits on the eastern tip of the Bisti.
- Foundations of a large temple, 16.25m X 32.88m, of local grey limestone with tight polygonal jointing rest midway along the rise of the park.
- Portions of trapezoidal walls, perhaps the *temenos* for the Demeter sanctuary, provide foundations for several buildings along the hillside of the Pron.
- Stretches of walling, formerly whitewashed, partially in situ orient the street to the north of the Church of Taxiarchi, and form part of the walling along the eastern end of the church and the corner of an adjacent house wall. *Spolia* (reused blocks) are found as masonry within the fabric of the church – many of these were revealed when the plaster coating was removed in 2014.
- Two columns flank the entrance to the square to the west of the Church of Taxiarchis.
- A low, perfectly flat platform of polygonal masonry is exposed in two large courses and provides both foundation and orientation for Latsou Street behind the Taverna Káti Psínetai on the southern or Mandrakia side of the *Pron* (not mentioned by Jameson, Runnels and van Andel 1994, 581–595).
- Trenches excavated by the Ephoria remain open in various locations around the town.
- A number of statue bases and various architectural blocks.
  - Some, probably removed from the Medieval crosswall, lie scattered about the surface near the church of Agios Nikolaos at the park entrance.
  - Some are to be found outside the town hall near the excavated basilica.
  - Others are found adjacent to buildings throughout the town – many are whitewashed.
- Portions of building walls are submerged in waters along the quay of the northern harbor (the Limani).
- A Roman sarcophagus lid, found in the course of dredging the harbor, sits in front of the office of the port police.
- Stone grave enclosures (*periboloi*), which contained multiple burials (mostly cists) from the Archaic through the Hellenistic period, frame the sides of an ancient street through the necropolis of the city. Excavated in the 1991 and then again in 1999 several of 14 funerary *periboloi* lie exposed in a field of the Ermioni High School along the main road into town on the north side of the Pron at Agios Andreas.
- A well is located on the edge of the Ermioni kambos near the junction of the roads from Kranidhi and Iliokastro.
- Portions of an aqueduct, whose waters mentioned by Pausanias flowed from 'Leimon' are present for a couple of hundred meters along the northern edge of the Pron.

**sketch plans of sites:
June 2016**

600 M

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge


Bed & BRKFST
stairs
Fish taverna
Municipal office with large lot in front
Stage
More recent
26:00
27:00
10
b2
b1
b1
b2
1
2
3
4
9
8
7
cement terrace
Large open area of school
Recent excavation

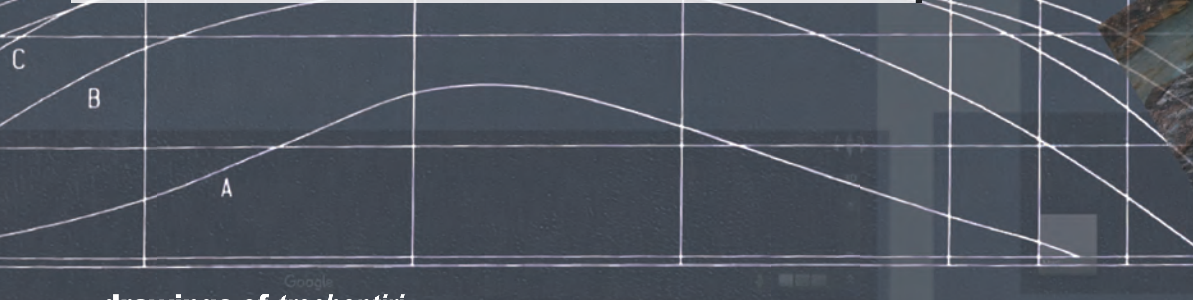

6/18/2014
Google Maps
Imagery ©2014 DigitalGlobe, Map data ©2014 Google

Metamorphosis and change

Change and metamorphosis emerges from a cascade of satellite imagery of Ermioni, Street Views, and photography whose window of everydayness extends but a little over a decade on Google Earth. Changes and metamorphoses may be glimpsed within the fabric of Ermioni itself: in a linear brick and mortar aqueduct collapsed and broken at intervals along its extent, in sections of polygonal walling without continuation, in pealing scabs of lime plaster on the exterior of houses relinquished to their own, in ruined olive presses, in disused warehouses used as trash dumps, or in the renovation of an house in the midst of the old and neglected. All totaled these are suggestive of the passage of time.

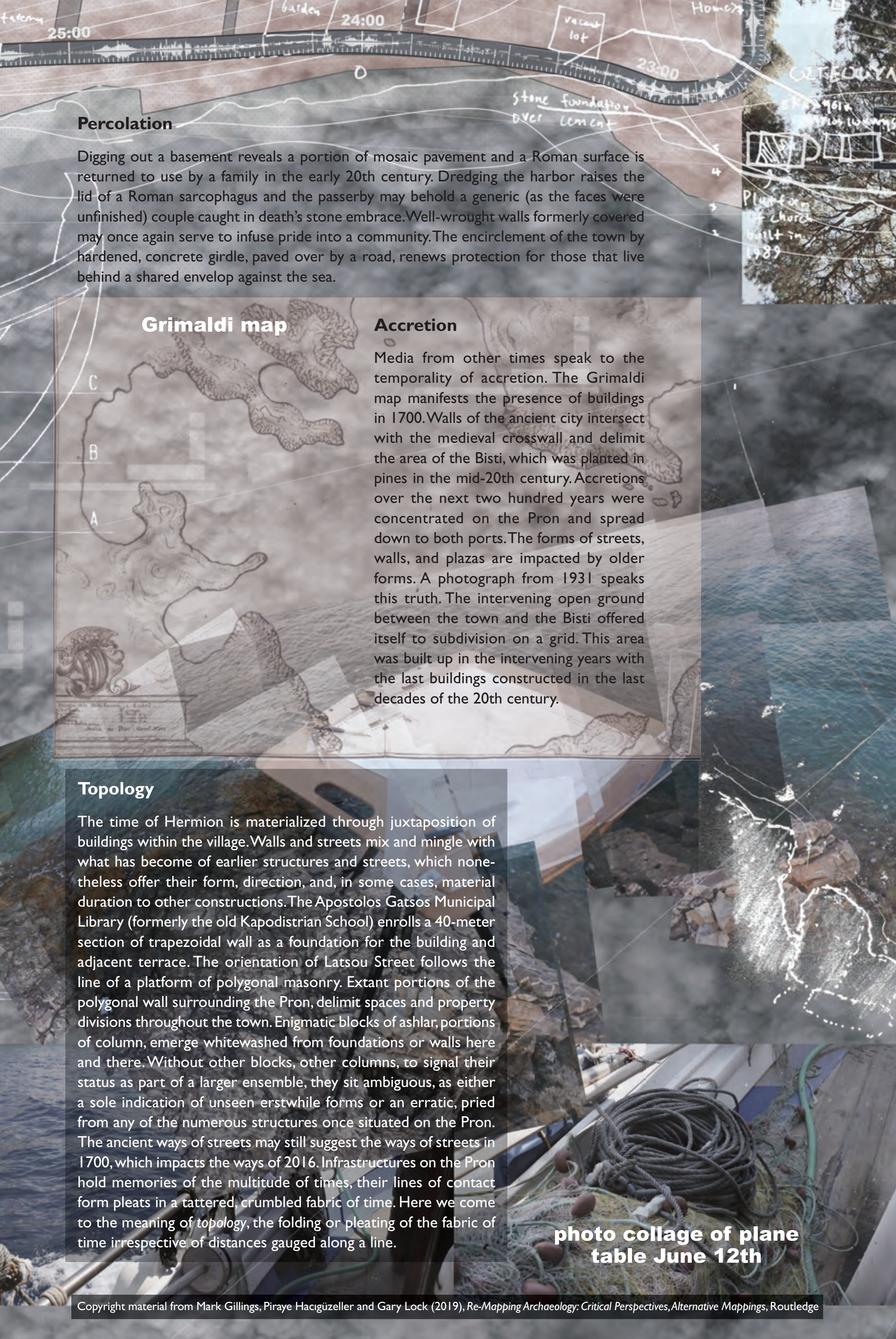
Papabass
Inscriptions
from Bisti

notes from summer 2014


7
8
9
1
C
B
A
b2
b1

drawings of *trechantiri*

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge


tavern
25:00
garden
24:00
vacant lot
Homes
0
23:00
stone foundation over cement
Platform of church built in 1989
C
B
A

Percolation

Digging out a basement reveals a portion of mosaic pavement and a Roman surface is returned to use by a family in the early 20th century. Dredging the harbor raises the lid of a Roman sarcophagus and the passerby may behold a generic (as the faces were unfinished) couple caught in death's stone embrace. Well-wrought walls formerly covered may once again serve to infuse pride into a community. The encirclement of the town by hardened, concrete girdle, paved over by a road, renews protection for those that live behind a shared envelop against the sea.

Grimaldi map

Accretion

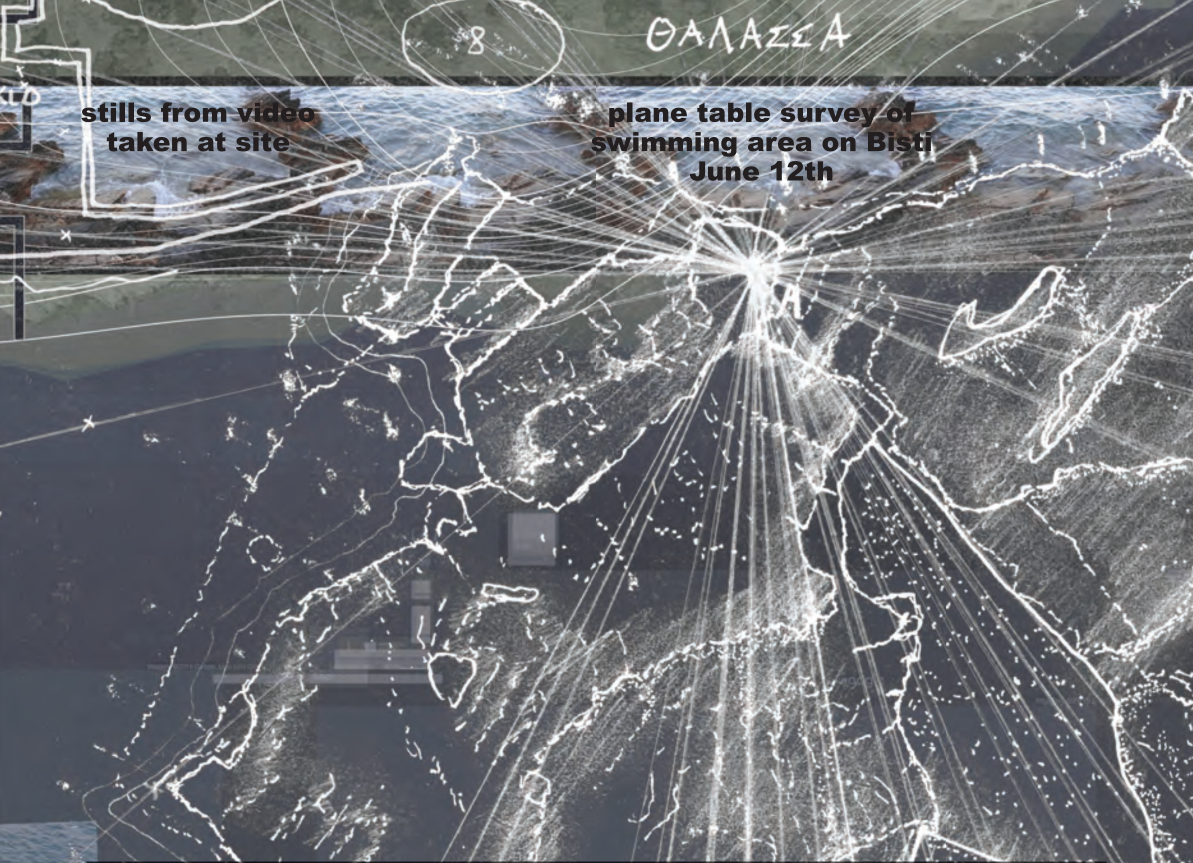
Media from other times speak to the temporality of accretion. The Grimaldi map manifests the presence of buildings in 1700. Walls of the ancient city intersect with the medieval crosswall and delimit the area of the Bisti, which was planted in pines in the mid-20th century. Accretions over the next two hundred years were concentrated on the Pron and spread down to both ports. The forms of streets, walls, and plazas are impacted by older forms. A photograph from 1931 speaks this truth. The intervening open ground between the town and the Bisti offered itself to subdivision on a grid. This area was built up in the intervening years with the last buildings constructed in the last decades of the 20th century.

Topology

The time of Hermion is materialized through juxtaposition of buildings within the village. Walls and streets mix and mingle with what has become of earlier structures and streets, which nonetheless offer their form, direction, and, in some cases, material duration to other constructions. The Apostolos Gatsos Municipal Library (formerly the old Kapodistrian School) enrolls a 40-meter section of trapezoidal wall as a foundation for the building and adjacent terrace. The orientation of Latsou Street follows the line of a platform of polygonal masonry. Extant portions of the polygonal wall surrounding the Pron, delimit spaces and property divisions throughout the town. Enigmatic blocks of ashlar, portions of column, emerge whitewashed from foundations or walls here and there. Without other blocks, other columns, to signal their status as part of a larger ensemble, they sit ambiguous, as either a sole indication of unseen erstwhile forms or an erratic, pried from any of the numerous structures once situated on the Pron. The ancient ways of streets may still suggest the ways of streets in 1700, which impacts the ways of 2016. Infrastructures on the Pron hold memories of the multitude of times, their lines of contact form pleats in a tattered, crumbled fabric of time. Here we come to the meaning of *topology*, the folding or pleating of the fabric of time irrespective of distances gauged along a line.

photo collage of plane table June 12th

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge


ΘΑΛΑΣΣΑ
8
stills from video taken at site
plane table survey of swimming area on Bisti June 12th

Belle noiseuses

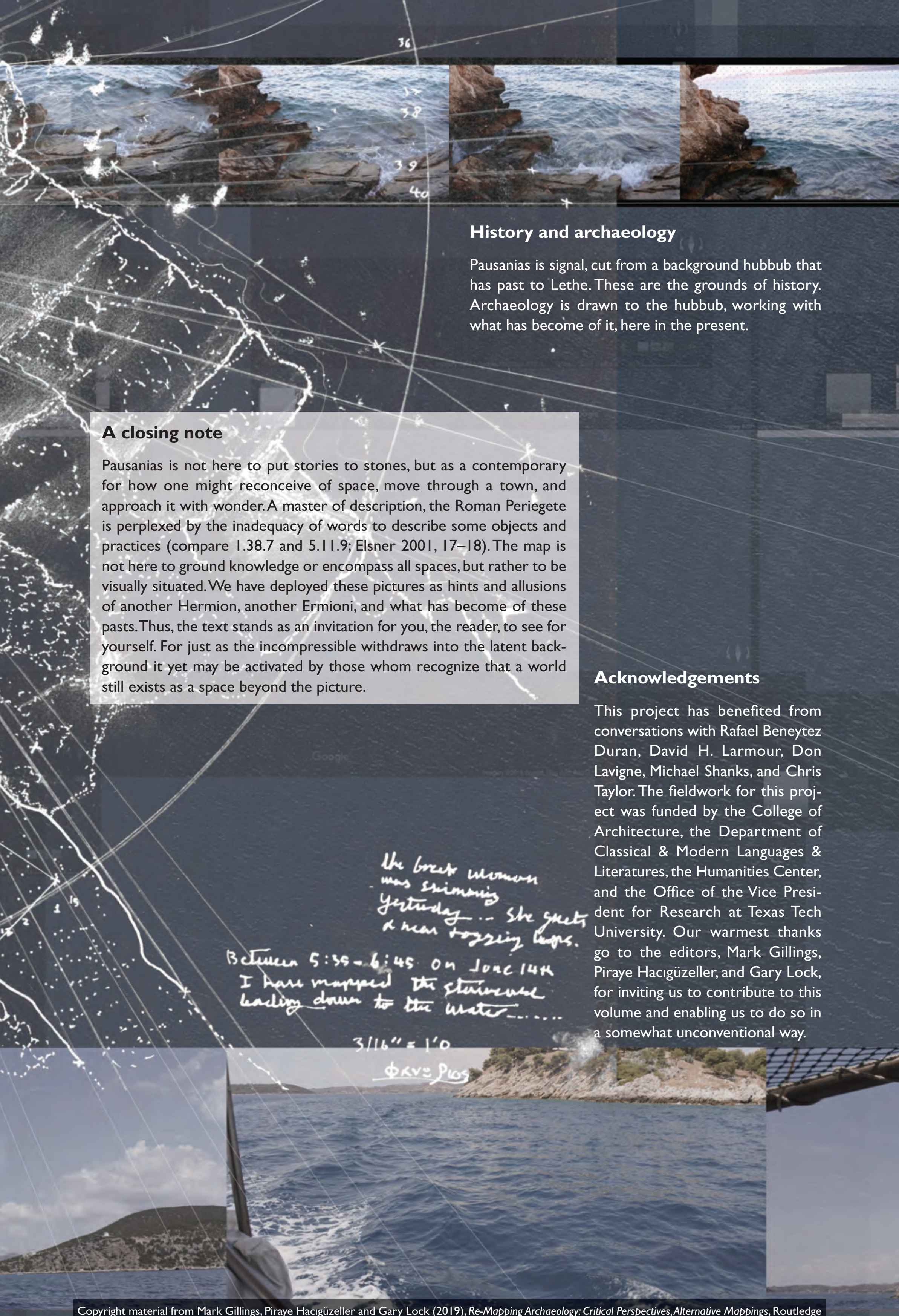
The sea holds few traces of the Hermion past. If something remains it settles to the bottom or works its way to shore or becomes like the water. With incessant commotion, lapping the hardened, harbor moles, the rock outcrops of the Bisti, the rising sea takes away stonewalls. It has lay claim to the theater, which, supposedly, was situated near the edge of the shore. There, the *belles noiseuses*, the beautiful uproar and ruckus of the unruly sea, is the background noise to information (Serres 1995). Its sound is unceasing. The sea constitutes one of archaeology's deep-temporal objects.

The domain of proteus

A continuous blue surface on Google maps; a rippled blue surface broken by the white wakes of boats on satellite imagery; a background for the figure of the land, the flat surface betrays the being of the sea, the two-dimensional fails to penetrate its depths, to appreciate its watery reality. A line on a map betrays the long wearing away of the peninsula, including the walls of the Bisti, by the sea. It fails to reveal the slow rise of the waters inundating the town, laying claim to the ruins of Hermion – sections of the city fortifications around the Bisti, have been undone by the sea; foundations in the north harbor scour the bottoms of boats (also Curtius 1852, 458); boats have brought others to a convenient quarry of cut stone situated between two harbors.

The waters that surround the peninsula are more than a part of the story. They are a reason for the town's existence. Hermion, Kastri, Ermioni, these were all maritime towns or villages, with fishers, divers, and sailors. Here, Hermionians entered the water, for a swim, for shells (the ancient city was renown for the purple dye it produced from *Murex trunculus*; see Jameson, Runnels and van Andel 1994, 316–319), for contests in honor of the god, Poseidon (Larmour 1990). The harbors are simply known as north and south harbor, the northern is called Limani, the southern one is called Mandrakia after the small enclosures which contain the boats near the shore. The very long term, encapsulated by an engagement. Pausanias knew and did not know these waters. He too heard the sound of the sea lapping a shore, both similar and different.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge



History and archaeology

Pausanias is signal, cut from a background hubbub that has past to Lethe. These are the grounds of history. Archaeology is drawn to the hubbub, working with what has become of it, here in the present.

A closing note

Pausanias is not here to put stories to stones, but as a contemporary for how one might reconceive of space, move through a town, and approach it with wonder. A master of description, the Roman Periegete is perplexed by the inadequacy of words to describe some objects and practices (compare 1.38.7 and 5.11.9; Elsner 2001, 17–18). The map is not here to ground knowledge or encompass all spaces, but rather to be visually situated. We have deployed these pictures as hints and allusions of another Hermion, another Ermioni, and what has become of these pasts. Thus, the text stands as an invitation for you, the reader, to see for yourself. For just as the incompressible withdraws into the latent background it yet may be activated by those whom recognize that a world still exists as a space beyond the picture.

Acknowledgements

This project has benefited from conversations with Rafael Beneytez Duran, David H. Larmour, Don Lavigne, Michael Shanks, and Chris Taylor. The fieldwork for this project was funded by the College of Architecture, the Department of Classical & Modern Languages & Literatures, the Humanities Center, and the Office of the Vice President for Research at Texas Tech University. Our warmest thanks go to the editors, Mark Gillings, Piraye Hacıgüzeller, and Gary Lock, for inviting us to contribute to this volume and enabling us to do so in a somewhat unconventional way.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

References

Alcock, S.E. (1993) *Graecia Capta: The Landscapes of Roman Greece*. Cambridge University Press, Cambridge.

Andrews, K. (2006) *Castles of the Morea*. The American School of Classical Studies at Athens, Princeton.

Arafat, K.W. (1996) *Pausanias' Greece: Ancient Artists and Roman Rulers*. Cambridge University Press, Cambridge.

Battersby, S.E., Finn, M.P., Usery, E.L., and Yamamoto, K.H. (2014) Implications of Web Mercator and Its Use in Online Mapping. *Cartographica* 29(2):85–101.

Borges, J.L. (1972) Of Exactitude in Science. In *A Universal History of Infamy* (trans. di Giovanni, N.T.). Dutton, New York.

Bory de Saint-Vincent, M. (1836) *Expédition Scientifique de Morée. Section des sciences physiques: Relation*. F.G. Levrault, Paris.

British Naval Intelligence Division (1944) *Greece, Vol. 1: Physical Geography, History, Administration and Peoples*. Geographical Handbook Series.

Brotton, J. (2012) *A History of the World in 12 Maps*. Penguin, New York.

Curtius, E. (1851–1852) *Peloponnesos, eine historisch-geographische Beschreibung der Halbinsel*. Vols. 1–2. Verlag von Justus Perthes, Gotha.

Diller, A. (1956) Pausanias in the Middle Ages. *Transactions and Proceedings of the American Philological Association* 87:84–97.

Diller, A. (1957) The Manuscripts of Pausanias. *Transactions and Proceedings of the American Philological Association* 88:169–188.

Driver, F. (2001) *Geography Militant: Cultures of Exploration and Empire*. Blackwell Publishers, Oxford.

Eisenstein, E. (1979) *The Printing Press as an Agent of Change*. 2 vols. Cambridge University Press, Cambridge.

Elsner, J. (1992) Pausanias: A Greek Pilgrim in the Roman World. *Past and Present* 135:3–29.

Elsner, J. (2001) Structuring "Greece:" Pausanias's *Periegesis* as a Literary Construct. In Alcock, S.E., Cherry, J.F., and Elsner, J. (eds.) *Pausanias: Travel and Memory in Roman Greece*. Oxford University Press, Oxford, pp. 3–20.

Faraklas, N. (1973) *Ermionis – Alias*. Ancient Greek Cities Reports 19. Athens.

Frickenhaus, A. and Müller, W. (1911) Aus der Argolis. *Mitteilungen des deutschen archäologischen Instituts. Athenische Abteilung* 36:23–29.

Gell, W. (1810) *The Itinerary of Greece*. T Payne, London.

Habicht, C. (1985) *Pausanias' Guide to Ancient Greece*. University of California Press, Berkeley.

Heidegger, M. (2002) The Age of the World Picture. In Young, J. and Haynes, K. (eds.) *Off the Beaten Track*. Cambridge University Press, Cambridge, pp. 57–72.

Heidegger, M. (2008) On the Essence of Truth. In Krell, D.F. (ed.) *Basic Writings*. Harper Perennial, London, pp. 111–138.

Hutton, W. (2005) *Describing Greece: Landscape and Literature in the* Periegesis *of Pausanias*. Cambridge University Press, Cambridge.

Jameson, M.H., Runnels, C.N., and Van Andel, T.H. (1994) *A Greek Countryside: The Southern Argolid from Prehistory to the Present Day*. Stanford University Press, Stanford.

Johnson, W.A. (2009) The Ancient Book. In Bagnall, R.S. (ed.) *The Oxford Handbook of Papyrology*. Oxford University Press, Oxford.

Larmour, D.H. (1990) Boat-Races and Swimming Contests at Hermione. *Aethlon* 7(2):127–138.

Latour, B. (1986) Visualization and Cognition: Thinking with Eyes and Hands. In Kuklick, H. and Long, E. (eds.) *Knowledge and Society: Studies in the Sociology of Culture Past and Present*. Vol. 6. JAI Press, London, pp. 1–40.

Latour, B. (2004) No Globe, But Plenty of Blogs . . . *Domus* 868:72–73.

Leake, W.M. (1830) *Travels in the Morea*. 3 vols. John Murray, London.

Lepetit, B. (1998) Missions scientifiques et expeditions militaries: remarques sur leurs modalités d'articulation. In Bourguet, M.N. (ed.) *L'Invention Scienfitique de la Méditerranée. Égypte, Morée, Algérie*. École des Hautes Études en Sciences Sociales, Paris, pp. 97–116.

McAllister, M.H. (1969) A Temple at Hermione. *Hesperia* 38:169–185.

McLucas, C. (2000) Ten Feet and Three Quarters of an Inch of Theatre. In Kaye, N. (ed.) *Site-Specific Art: Performance, Place, and Documentation*. Routledge, London, pp. 125–138.

Miller, G. (2014) The Huge, Unseen Operation behind the Accuracy of Google Maps. *Wired*. www.wired.com/2014/12/google-maps-ground-truth/ Accessed 6 Feb 2017.

Myers, A. (2010) Camp Delta, Google Earth and the Ethics of Remote Sensing in Archaeology. *World Archaeology* 42(3):455–467.

November, V., Camacho-Hübner, E. and Latour, B. (2010) Entering a Risky Territory: Space in the Age of Digital Navigation. *Environment and Planning D: Society and Space* 28:581–599.

Peytier, M.M., Puillion-Boblay, E. and Servier, M. (1833) Notice sur les opérations géodésiques exécutées en Morée, en 1829 et 1830, par MM. Peytier, Puillon-Boblay et Servier; suivie d'un catalogue des positions géographiques des principaux points déterminés par ces operations. *Bulletin de la Société de géographie* 19:117–122.

Philadelphieus, A. (1909) Ai en Hermionidi anaskaphai. *Praktika* 172–184.

Pretzler, M. (2007) *Pausanias: Travel Writing in Ancient Greece*. Duckworth, London.

Reynolds, L.D. and Wilson, N.G. (2013) *Scribes and Scholars: A Guide to the Transmission of Greek and Latin Literature*. Fourth Edition. Oxford University Press, Oxford.

Schubart, J.H.C. (1853) Über die Handschriften des Pausanias. *Zeitschrift für Altertumswissenschaften* 20:385–510.

Serres, M. (1995) *Genesis*. (trans James, G. and Nielson, J.). Ann Arbor, MI: University of Michigan Press.

Shanks, M. (2004) Three Rooms: Archaeology and Performance. *Journal of Social Archaeology* 4(2):147–180.

Shanks, M. and Webmoor, T. (2013) A Political Economy of Visual Media in Archaeology. In Bonde, S. and Houston, S. (eds.) *Representing the Past: Archaeology through Text and Image*. Oxbow Books, Oxford, pp. 85–108.

Sloterdijk, P. (2005) Atmospheric Politics. In Latour, B. and Weibel, P. (eds.) *Making Things Public: Atmospheres of Democracy*. The MIT Press, Cambridge, pp. 944–951.

Sloterdijk, P. (2013) *In the World Interior of Capital: For a Philosophical Theory of Globalization*. (trans Hoban, W.). Polity Press, Cambridge.

Sloterdijk, P. (2014) *Globes: Macrospherology*. (trans Hoban, W.) Semiotext(e), Cambridge.

Stewart, D.R. (2013) "Most Worth Remembering" Pausanias, Analogy, and Classical Archaeology. *Hesperia* 82:231–261.

Talbert, R.J.A. (2012) *Ancient Perspectives: Maps and Their Place in Mesopotamia, Egypt, Greece & Rome*. The University of Chicago Press, Chicago.

Turnbull, D. (1993) *Maps Are Territories: Science Is an Atlas*. The University of Chicago Press, Chicago.

Turner, A.J. (2006) *Introduction to Neogeography*. O'Reilly Media: Sebastopol, CA.

Wagstaff, M. (2001) Pausanias and the Topographers: The Case of Colonel Leake. In Alcock, S.E., Cherry, J.F., and Elsner, J. (eds.) *Pausanias: Travel and Memory in Roman Greece*. Oxford University Press, Oxford, pp. 190–206.

Witmore, C. (2009) Prolegomena to Open Pasts: On Archaeological Memory Practices. *Archaeologies* 5(3):511–545.

Witmore, C. (2013) The World on a Flat Surface: Maps from the Archaeology of Greece and Beyond. In Bonde, S. and Houston, S. (eds.) *Representing the Past: Archaeology through Text and Image*. Oxbow Books, Oxford, pp. 127–152.

Witmore, C. and Buttrey, T.V. (2008) William Martin Leake: A Contemporary of P.O. Brøndsted, in Greece and in London. In Rasmussen, B.B., Jenson, J.S., Lund, J., and Märcher, M. (eds.) *P.O. Brøndsted (1780–1842): A Danish Classicist in His European Context*. The Royal Danish Academy, Copenhagen, pp. 15–34.

Copyright material from Mark Gillings, Piraye Hacıgüzeller and Gary Lock (2019), *Re-Mapping Archaeology: Critical Perspectives, Alternative Mappings*, Routledge

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

10 Re-thinking the conversation

A geomythological deep map

Erin Kavanagh

Introduction

> Understanding a landscape is to decode its deep narrative topography. It is to acknowledge that every act of mapping is to enter into a dialogue with the inscribed voices of the past and to re-inscribe every mapped place for the future.
> (Ethington and Toyosawa 2015, p. 97)

But what happens if only some voices are inscribed?

As we have seen in response to refugees and terrorism, when only some voices are heard divisions of silence are created (Godin and Doná 2016; Sigona 2014). People drop off the map. A segregation of listening results in assumed hierarchies that do not speak for all inhabitants, limiting understanding. They build walls instead of bridges in our mental route ways; and walls offer an often-false sense of stability, constraining the horizon. When the stability of the status quo is questioned, thinking falls all too easily into binary mode, resulting in a polarized rhetoric that excludes more than it includes, sheltering beneath familiarity bias. The 'world as it is' (Hedges 2011) becomes redrawn as a mythical map, clung to in order to make sense of our conceptual and physical landscapes (and which often renders us oblivious to the obvious, even when it is beneath our very feet – Figure10.1). Since format can distract attention away from content and condition value without context, we fall into making judgements based on limited perception whilst attempting to enforce traditional patterns of order upon a shifting tide.

If, instead of attempting to enforce existing parameters, one wishes to take a stance that is outside of the expected territory, then a different type of topographical chart may be helpful. Using such a chart takes one out into choppy waters beyond the normative, rocking the categories within which fears have gathered to buoy up a closed worldview. Sometimes this insularity is wilfully maintained, sometimes it arises simply because people do not look beyond their immediate horizon because they do not speak the language there. Rather than learning the language, or applying a translator, they deride its accent and cluster before a vista which is comfortably flat.

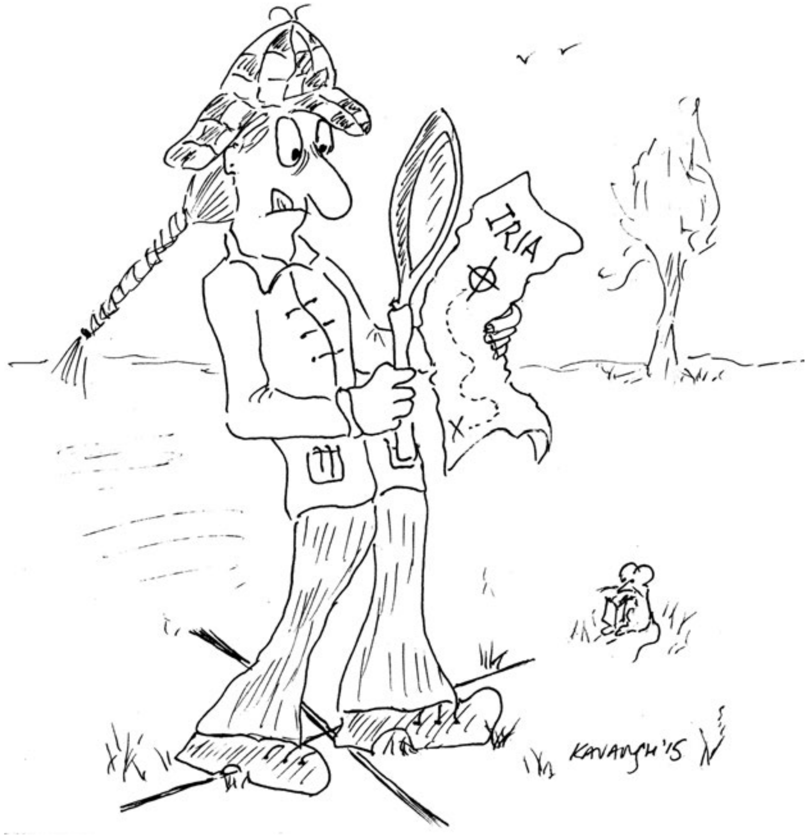


Figure 10.1 Iria – Copyright: Erin Kavanagh 2015.

Consequently, if you want to get somebody's attention then you may have to step into this parochial hideaway, duck under their (and your own) comfort zone to unravel normativity from inside; become conceptually multilingual. For a circumscribed response to difference is more than just politics, it is the insidious limitations grown by cultural emplotment (Ricoeur 1983); a chronic intellectual insecurity, an anxiety towards the unknown. It is a disinclination to engage with an unfamiliar map.

Within academia this disinclination is displayed all too frequently through a fear of other people's big words. One's own big words are perfectly fine but in the foreign land of another department they speak in strange tongues. Few more so than between science and the arts; but also within facets of disciplines themselves, such as between theoretically engaged and non-theoretically engaged archaeologists, where language barriers can sometimes be wielded like shields in battle.

So how may we translate across such self-imposed borders, to rethink the conversation? I am examining this question by utilizing a fusion of geomythology and deep-mapping, from the perspective of archaeological narrative. For archaeology has sufficient breadth to straddle these divides, it is part of "the challenge of the environmental humanities as a transdisciplinary matrix" (Heise 2014, paragraph 1), as a constantly evolving assemblage of compound practices. Archaeology is more than a discipline, it is a "cultural disposition" (Shanks and Svabo 2013, p. 1) and as such it is able to bend its disposition to consider alternative influences.

Before I get to that though, for the sake of clarity I shall summarise the key terminological background here.

Mapping terms and theory

For my purposes, *stories* are defined as a connected series of events, told through various means, not restricted merely to the written word. They may be factual, fictional or a combination of the two. *Facts* are defined as that which is referential and *fiction* to be that which isn't (Genette 1991; Cohn 1999). The two blend within my chosen fields into a *trans*disciplinary form of spatial storytelling, where empirical and non-empirical perspectives coalesce. Archaeology lends itself to hosting this type of exploration because it is already inherently multifaceted due to the collaborative nature of its own construction; palynology, palaeontology, vertebrate palaeontology, malacology, entomology, geochemistry, soil micromorphology, bathymetry, sedimentology . . . and so on and so forth . . . all work together to produce a conclusion. Not always a harmonious one, but a conclusion nonetheless. Despite this, archaeology is oft considered to be encased in a dualistic camp, referring to two distinct but interconnected practices which are prevalent throughout all of the various facets; the acquisition of tangible data from past actualities (Joyce 2002) and the presentation of their contexts through word and image (Deetz 1988).

It is the marriage between these two that creates attestation, or knowledge, depending upon opinion (and it is here where a permeability of fact and fiction can reside). A constant layering of fragments fuse together into a script, a ladder of production which is ultimately more than just 'double voiced' (Bakhtin 1981, 1984). Rather, it is an elasticity of utterances which are inherently open to reproduction, reinterpretation, representation over time. As such it, therefore, acquires the structure of a 'narrative', wherein there is a beginning, a middle and an end (White 1987) through the experience of the audience. For the audience encounters snippets of this unified exchange, bringing to it an act of recognition that reframes mere words and images into being as a story with provisional finality, where a story is thus a series of narrated events (Genette 1988). In this instance, the events are historically situated as past actualities. If we then apply Paul Ricoeur's notion of narration (1983), then this combination of description (an account, or representation, of X) and prescription (a judgement about X), where X is a past actuality, we have what constitutes an archaeological narrative.

This is not the only manner in which storytelling is integral to the practice of archaeology. From Alan Garner to H.G.Wells, storytellers have an established tradition of using science as a source for inspiration and as a mode by which to engage people with ideas – but the reverse is also true. Just as fiction appropriates science (and history) to lend some alleged credibility to imaginary worlds, so archaeology dresses factual worlds in the imaginary, with data decked out in clothes borrowed from folklore, fairy tales and the fantastic. This makes what could otherwise be 'dry science' more accessible and engenders a sense of ownership towards the material culture; for people identify with the tales through imagination, they associate their colour with the site, and so come to identify with the site by proxy. That identification engenders a personal connection which encourages a protective attitude, therefore utilizing familiar stories becomes a way by which a concept, site or artefact can accrue public engagement. This technique is also employed by journalists, sometimes with one leading people into another before the science shows itself. Thus, international articles on climate change are often seen under headings about Atlantis, or Noah, whilst county papers utilise local tales like Cantre'r Gwaelod or Lyonesse. The narrative form becomes a map in which the supposed facts sit as landmarks, with sentences and imagery as direction and the topography a memory of the shape a story can make inside one's head.

Geomythology approaches this collage in a slightly different way. Predominantly the study of geoscience and myth, it straddles classics, literature, anthropology, archaeology (theory and field), geology, history, philology, philosophy . . . there are no disciplines whose stones are left unturned in order to find the natural phenomena which may be encoded within a story.

Although the term itself was only coined 50 years ago by the geologist Dorothy Vitaliano (1968), geomythology is not a new practice. From the earliest recesses of classical antiquity scholars have grappled with the notion that archaic cosmological narratives may be contained in epic poems and accounts, such as Homer's *Iliad* (circa 760–710 BCE, cf. Fagles 1990) and Hesiod's *Theogeny* (circa 700 BCE, cf. Caldwell 1987). From the paradoxographer Palaephatus to the philosophy of Plato, from Strabo's geography and on to Pliny the Elder's natural history, pioneering explorations were undertaken to seek the relationship between tales of the land and the land itself, between the intangible patterns of mythology and the tangible ones of empiricism. These discussions were inherently multidisciplinary and continued to be so throughout antiquarianism in the West until the Victorian era. At this juncture, the fashion for 'useful knowledge' took over, separating the sisters of science and story into competing disciplines over which science wore the crown (Keene 2015).

Bounded in the epistemic bias of orthodox perspectives storytelling has since been dismissed as an inferior feature in the intellectual landscape (Gazin-Schwartz and Holtorf 1999), a source to be critiqued or stood behind as a bridge for public engagement but not as a partner to be afforded equal value. Therefore, despite the combined essence of geomythological research, emphasis has always remained upon examining what alleged facts may be hidden in the tracks of alleged fictions.

In so doing, modern geomythological studies sieve land and seascape stories through the purview of geoscience (Mayor 2004; Nunn 2012, 2014a, 2014b; Vitaliano 1973, 2007). The truth chased has been incarcerated because the communication consistently runs only in the one direction: science asks of myth a question, myth attempts to answer, science decides whether or not the answer was ‘correct’, then asks another question. And so on and so forth. The questions asked are always variations upon: ‘Dear Miss Myth, how much can we stretch your tangibility . . . are you really real? ‘ (Figure 10.2).

Reality is defined in this practice as being something that can be empirically proven; it is not a philosophically informed concept. Miss Myth is then either disregarded as being ‘false and fanciful’, a ‘silly story’, or she receives a pat on the head for having got some of it ‘right’. Sir Science goes on his way, in search of the next tale to plunder.

It is rare for Miss Myth to be allowed to question back, or to challenge the decisions made. She is dismissed as being naïve, primitive, superstitious because she is allegedly ‘pre-scientific’ and therefore surely cannot possess

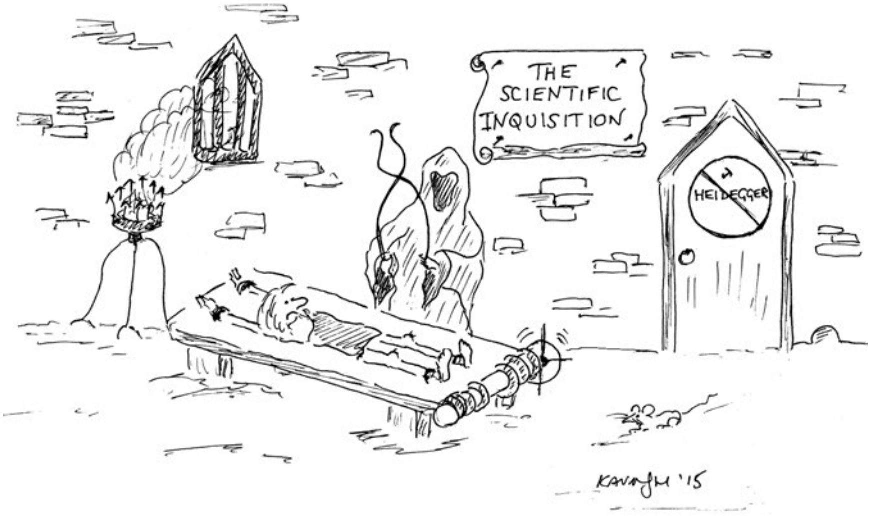


Figure 10.2 The Inquisition – Copyright: Erin Kavanagh 2015.

the appropriate skills. She rarely has her offerings understood from within their own position as stories rather than as technical reports. Instead, they are examined out of context whilst she stands in the dock, awaiting her judgement (Figure 10.3). The impact of this is that having met at a crossroads, the champions of science and mythology never quite engage in a constructive discussion (Piccardi and Masse 2007) and, thus, eventually continue in their merry ways along different paths, albeit often with the same destination in mind – that of engaging with land and seacapes authentically.

Therefore, I wondered; what would happen if we gave them an equal stage? What if the orthodox hierarchy were to be dismantled and instead of being a diktat, an inquisition, the geomythological discussion became a demotic cartographical construct (Pluciennik 2015) that all routes across the land could share. Where the real is composed of "things-in-phenomena" in which phenomena constitute the ontological primitive unbounded by oligarchical awards of meaning (Barad 2003, p. 817). Thus, instead of having a striation of isolated narrative paths arguing through our communities, we would have a coalition, an interpretative polyphony; a deep map.

A deep map is not a thin map. Or at least, it is not a single, thin, map. It is a folding of site-specific representations whose connection with a cartographical map is akin to the relationship between a "thick" and a "thin" description (Geertz 1973; Holloway 1997; Ryle 1949). This is because it creates a pattern of social and cultural relationships, connections which go beyond any single account. It transcends a mere statement of facts, allowing

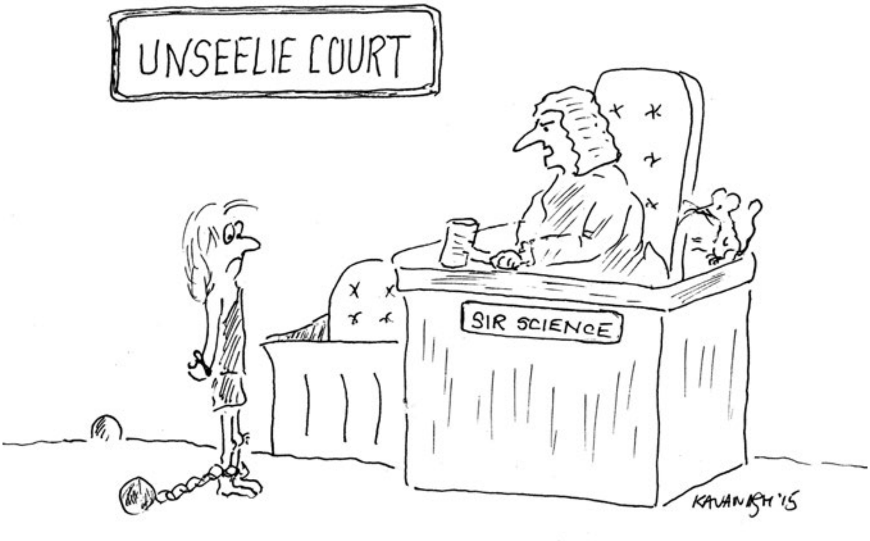


Figure 10.3 Diktat v. Demotic – Copyright: Erin Kavanagh 2015.

for poly-dimensional signification; "it is performativity put to work" (Roberts 2016, p. viii).

It is also, rarely, able to be singular for it applies the term 'map' from the 16th-century Latin *mappa mundi* – 'sheet of the world' – and adds depth by integrating more than one sheet at a time from many accounts of the location. It is a collection of data that shows an area where the geographic features are accompanied by conceptual ones, such as those of folktale, literature and music. It is a palimpsest of perception.

Deep maps do not adhere to empirical legislation, they "do not explicitly seek authority . . . but provoke negotiation between insiders and outsiders, experts and contributors, over what is represented and how. Framed as a conversation and not a statement . . ." (Bodenhamer et al. 2015, p. 4). In this way, the deep map can become a conduit for rethinking geomythological research and archaeological representation.

As an approach to synergizing multi-vocality (Bender 1998; Hodder 1999), Deep Mapping's lineage has been well documented elsewhere (see Bodenhamer et al. 2015; Roberts 2016) and is thus not required here. Suffice to say that within archaeology it was infamously appropriated by Michael Shanks and Mike Pearson, in conjunction with Cliff McLucas, through theatre/archaeology in the guise of Brith Gof. Their practice was essentially a site-specific response to landscape that attempted to 'open' place by laminating often-tensioned approaches to the same locale. Applying the model of antiquarianism, they considered a deep map to be a conceptual stratification that reflects "everything you might ever want to say about a place" (Pearson and Shanks 2001, p. 65). It is therefore even more than just a two-way conversation; it is a heteroglossic debate.

Defined by Bakhtin (1981) as being a 'national language' through which multiple speech types, or dialects, converse, heteroglossia can itself be layered. This layering creates a polyphony of interdigitating internal stratifications (Bakhtin 1981, 1984). Characterised by the independent power of each containing voice, polyphonic narratives are inherently open ended (Joyce 2002). Simultaneity supercedes linearity, particularly when stories are told through more than text alone. As an output it, therefore, hopes to honour all areas equally and when applied to archaeology could be described as a multifaceted depiction of time and place, embedding evidence within its spatial temporal context from hitherto unexplored angles. It reframes perspective and in so doing unsettles pre-existing authorities.

In this manner the deep map can be said to resonate with Karen Barad's onto-ethico-epistemology in that it represents phenomena revealed through the ontological inseparability of intra-acting agencies (Barad 1999, 2003, 2007). Through being both inter and intra-actional, responsibility is shared and unrestrained by finite conditions. The agencies in question are the various disciplinary voices who, in actively listening to one another, are able to converse harmoniously rather than in competition; creating a choir instead of a row. For in changing the apparatus, the map, we make the world differently; we expose the invisible.

Of course, this anthropology of practice can be effectively achieved with alternative 'thin' mapping also. Where deep mapping is conditioned to address the creases, the unplotted domains, to essay the intermezzos and edges by its multi-scalar dimensionality, its thinner counterpart can also levy into hitherto unexplored cracks in our praxis. Two examples of this come from Nishat Awan, University of Sheffield and Hagit Keysar of the Public Lab in Jerusalem (Public Lab 2015).

Awan's discipline is architecture, a remit which she extends to include the exploration of migratory spaces. She explores borders, boundaries and thresholds of identity through spatial mapping in order to examine and record the lived narratives of citizenship in our rapidly changing world. The perspective taken is not the one of official authority, however; it is taken from eyes who are hidden inside the margins of society. These maps are not cartographical propaganda; they depict intimate journeys in search of freedom.

Awan's aim is to make public these spaces and citizens who have been pushed to the perimeters, both physically and politically; to challenge our normative assumptions about land and landscape, about a sense of belonging that transcends birth right and paper residency. As uncertainty grows on all sides of the refugee rhetoric there is an increasing urgency behind collating an informed portal for fair discussion. With the *Topographical Atlas of European Belonging* (Awan 2016) she has found a way of allowing visual media to lend itself to this end with sensitive acuity.

Collected as part of this project to define Europe's ambiguous edges, the two images I have included represent the direct experience of individual migrations across and along these shifting frontiers. These maps speak in fragments, from moments of recollection. They are experience.

The first image (Figure 10.4) is of a Syrian man drawing his journey away from home. His pen's narrative loops around the friends who showed him hospitality as he navigated back and forth between Syria, Lebanon and Turkey. An activist leaving in fear for his life the words he spoke told of obstacles, confused dates and a gratitude for having been able to slip between places and danger with few questions raised.

The second image (Figure 10.5) is of an Afghan woman drawing her passage out of Afghanistan. Her map was small, her knowledge of where she had been, minimal, for she mostly travelled under cover of darkness. A memory of Tajikistan, of family, people smugglers and moving through the night directed her hand. Time was marked by body chronologies, such as the birth and age of her children. Upon arriving in what she thought was Slovenia but was actually Ukraine, Awan says that this lady wondered if she was now looking upon what Europe was.

These issues of identity and the fragility of belonging pervade the collection, which has been both exhibited and published online. Supported by the Independent Social Research Foundation (ISRF), the project continues

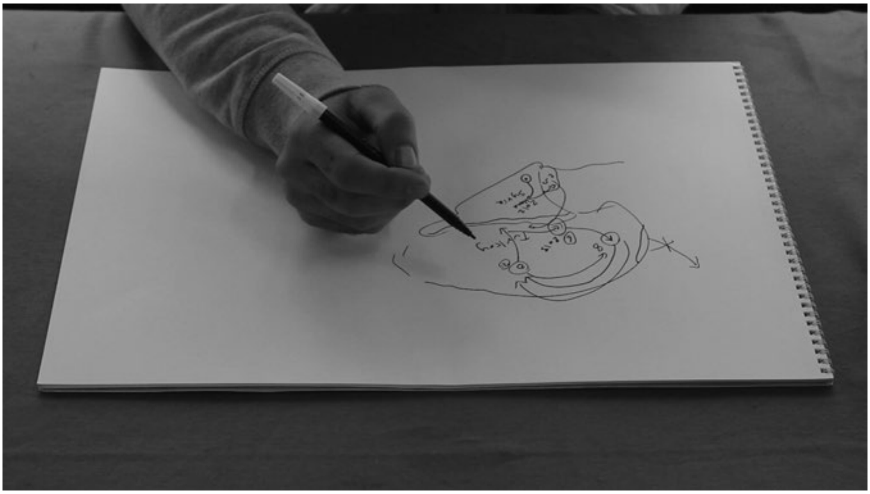


Figure 10.4 Map of a migrant journey out of Syria – Copyright: Nishat Awan and Cressida Kocienski, 2016.

Figure 10.5 Map of a migrant journey out of Afghanistan – Copyright: Nishat Awan and Cressida Kocienski, 2016.

to seek changes in our comprehension of division and humanity. For the digital mapping is not an end in itself; rather, it simply identifies the terrain we have yet to walk.

A very different example of how a change of mapping apparatus can alter the geographical perspective comes from Hagit Keysar, an anthropologist, artist and activist based in Israel-Palestine. She has been working extensively with Public Lab in Jerusalem (Keysar 2016), enabling both Israeli and Palestinian communities to make their own balloon or kite-elevated cameras with which to take aerial photographs of the urban environments in which they reside. These cameras come in a basic kit form that are easily constructed and can be used discreetly, disguised amongst recreational kites and balloons (Figure 10.6). They are also quieter than a quadcopter and with considerably less maintenance or structural vulnerability. As a citizen-led initiative, this project has been exploring the political and social implications of collaborative technologies in places of civil inequality and conflict. Developed through a partnering of architects and planners with communities and activists, the collaborators have been united in their need for a DIY form of mapmaking.

Keysar says that, for her, the central impetus has been to step away from directly contesting the official, conflicting, maps which supported propaganda and instead to find a new way of seeing the city; to navigate away from the authoritative jurisdictions of formal political discourse and into the spaces in between where communities are adapting to an ever-changing environment. Her aim has been to liberate the relational patterns between place and people.

The resulting maps depict homes and pathways which have been destroyed by industrial development. They reveal villages whose existence is publicly denied. They decolonize the skies as inhabitants photograph their presence from the end of a piece of string, claiming their civilian view from the state's presentation of spaces. The aerial photographs are then able to be used as evidence, to challenge political rhetoric, to defend the otherwise defenceless.

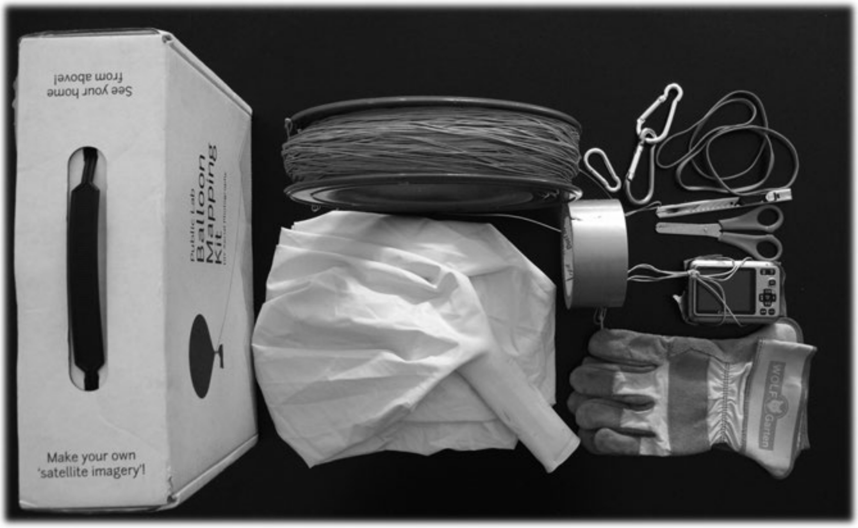


Figure 10.6 Public Lab Balloon Mapping Tool Kit – Copyright: Public Lab 2015.

Away from the domination of authoritative opinion, they allow a new way of seeing; these maps give a voice to the invisible (Figure 10.7).

New ways of seeing, where the authority is even handed across areas of expertise, is the premise I have worked from with my own mapping projects. Where Keysar has taken aerial photography as her canvas and Awan found herself recording memory, one of the routes I embarked upon was to step into the humanities with layers of myth and landscape through film, inspired by the work of Robert Ascher (1981, 1988, 1991).

In addition to his extensive contribution towards the birth of post-processual archaeology, Robert Ascher was also an anthropologist, an artist, a mythographer through film (Ramey 2014). Having become dissatisfied with orthodox modes of representation within the humanities, asserting that "to reach a wider community, writing is not enough" (1981, p. 67), he explored alternatives that took a more "oblique perception so necessary to the interpretation of culture." Considering this obliqueness to be the jurisdiction of the arts, at Cornell he experimented with the inherent

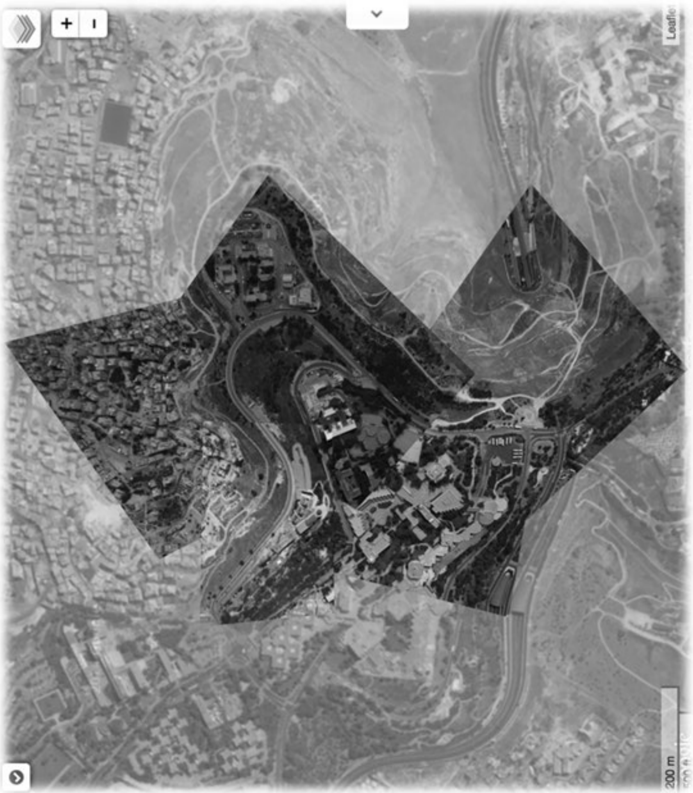


Figure 10.7 DIY aerial photograph above Hebrew University – Copyright: Public Lab 2014.

interplay film embodies between dream and non-dream (Langer 1953), through applying direct camera-less animation to myth. This technique, which involves drawing directly onto celluloid, allows the film maker to retain total control; it is not a collaborative affair. As such, it then becomes lone authored, a visual kin to an academic paper like the one you are currently reading. However, it is still well disposed towards being a form of deep-mapping because film, myth and dream have an unconstrained relationship with time; fact and fiction merge; geography is fluid and voices intersect one another. Abstractions are fragmented further, without loss of coherency. Together they tell a story on many levels, thus filtered through an anthropological lens this triad allows one individual to translate culture with minimum intrusion.

The result is a series of four short films that allow myth to be its many faceted nature, including "a kind of map that directs and guides people through anything from property rights to behaviour toward the gods" (Ascher 1981, p. 70). Watching these many years after their conception, I was struck by the freedom they still possess, the freedom to speak symbolically; the way tales do and science attempts to not.

It is this tension between the two different modes of communication, one in which the cultural imagination is free to roam and one in which it is not, that I seek to address through deep mapping geomythology. Instead of untangling a cumulative ball of interpreted experience into neat little skeins, geomythology would instead thread them even closer together into a weave within "which the successive episodes of deposition, or layers of activity, remain superimposed one upon the other without loss of evidence, but are so re-worked and mixed together that it is difficult or impossible to separate them out into their original constituents" (Bailey 2007, p. 204).

I wondered, would this trigger a type of interactive causation where overlapping scales of reference interact, resulting in the blurring of divisions, thus allowing for mutual transformation that could change the way we engage with one another academically?

Just as we can see the various folds of geoscience through the different specialisms it employs, we see an equivalent within the arts, when drama and music come together, painting and installations – but what equivalent stratigraphy of process may be revealed from within a geomyth through a deep map that engages science with story, story with science, if all are represented without any attempt to tear them apart? The key, I decided, lay in the manner of engagement. After Ascher, film was an obvious choice of containment for the weaving of things. However, this film would not be sole authored, it would bring together similar combinations of drawing and footage with words and sound; but from disparate sources.

This unity could be expressed through a re-working of the term *pragmatology* by Michael Shanks, wherein it means not the study of that which is practical (although that is not excluded) but the theory and practice of *pragmata*. Pragmata are 'things' in Ancient Greek. "The verb at the root of pragmata is *prattein* – to act in the material world, engaged with things" (Rathje et al. 2013, p. 5). These include that which is active as well as passive; so deeds and doings, duties and obligations, encounters and responses. Pragmatology is the creative process of engagement with things in the material world, where 'things' are not individually discrete but become themselves through our involvement with them. How we relate to the past, and to each other about the past, delineates how it exists and there can be no end to the manner in which it is rewritten, reframed, rethought.

The bridge

I applied this theory to my research into the flood stories of West Wales. Some of these have a trackable lineage of <1,000 years, whereas the geo/archaeological data with which I related them spans inundation from >15,000 years. The former is due to how far back we have extant literature, the latter from the first known flood, following the last glacial maximum (Haynes et al. 1977; Shi and Lamb 1991). This process has led me to grapple with a wide breadth of disciplines which don't commonly share a desk; from medieval Welsh texts through the semiotics of modern folk stories to bore holing, sample processing in the lab, composing poetry and trawling inside archives.

Amongst the tales that have kept me company through the endless mud and words has been that of Bendigeidfran and Branwen, from *The Mabinogi*. *The Mabinogi* is a group of four stories from within a larger collection of eleven texts composed in Middle Welsh which possibly originated as oral tales, then being later written out by monks within *The White Book of Rhydderch* and *The Red Book of Hergest*, circa 1350 and 1400, respectively (Davies 2007).

In one of the branches, Branwen, daughter of Llŷr (sister of Bendigeidfran, son of Llŷr and King Over the Island of the Mighty) is married off to the King of Ireland as part of a political alliance. The plan backfires from the offset; eventually Branwen sends a message home for help via a starling. Bendigeidfran then summons an army and goes over to Ireland with the intention of sorting things out. Again, that doesn't go quite as well as hoped. So what we have is a clash of communication between West Wales and East Ireland, a marital dispute, a sea crossing through flooded land – and the tragedy of ensuing war.

It was the sea crossing and references to trees appearing in the waves that attracted my attention. I consequently analysed this text per my own methodology, for details of which I refer to an earlier work (Kavanagh 2015), for the sake of brevity. Suffice to state that, in conclusion, I was comfortable positing that there was sufficient correlation between the geoscientific and the mythological data to argue for what has been taken to be fiction to now be taken to be possible fact. That if Bendigeidfran had been a 'real' man, then he may indeed have been able to look as if he walked across the Irish Sea from shore to shore.

Upon reaching this stage, I selected significant points of information and imagery, wrapping them into a short film in collaboration with six other experts. The film maker, Jacob Whittaker, and I layered sketches with footage, quotations with interpretive song and original music. The purpose of this was for it to serve as a Proof of Concept (POC) pilot to test the interdisciplinary methodology, rather than to be a completed product in its own right.

However, it does stand alone. As a time capsule for that stage of deep-mapping, Y Bont/The Bridge (2015) reflects one small stretch of coastline across space and disciplines. It does not compromise integrity and aims to re-establish the very foundation upon which normative perspectives reside. We hope it will also cause viewers to not feel like they now *know* something new, but rather that they have the desire to go and find out more about the things which we included (Ramey 2014). It is thus a post-representational expression of cultural communication that forms just one digitised layer of a deep map, itself an assemblage of iterations where "boundaries do not sit still" (Barad 2003, p. 817).

In this manner, it is transmedial. "Transmedia intertextuality works to position consumers as powerful players while disavowing commercial manipulation. It levels ideological conflict" wrote Marsha Kinder (1991, p. 119). Somewhat transmedial and intertextual in her own right, Kinder has published over a hundred essays along with a range of books and films across a breadth of genres since the 1960s, always with narrative as her continuous theme. She coined the term *transmedia* to encompass interactive, multifaceted platforms as a seed for change in which ideological conflicts within established and reforming narratives can seek to attain unification. This unification is sought by levelling the playing field in which normally competing communities battle. Instead, they are given equal space to communicate in their own manner, without the insidious antagonism of hierarchy. It isn't about diluting everybody and everything into one uniform consensus thought, rather it is about facilitating the different expressions of one narrative through a plethora of portals.

An example of this would be the Indiana Jones franchise. It began not with the film *Raiders of the Lost Ark* in 1981, but with one called *The Secret of the Incas* in 1954. Since then, it has spanned a rewrite, sequels, books, comics, toys, a television show . . . until now the only people left creating about Indy are the audience themselves, via such formats as Minecraft, tourism situated participatory culture, social media and cosplay. It has inspired generations of children to investigate archaeology, been used to both build and break down stereotypes within the field (Mickel 2015), and has thus over reached the boundaries of commercial control to take on adventures of its own.

Transmedia storytelling of this kind has become so embedded in our culture during the last 20 years that Carl Scolari and Indrel Ibrus point out how we now have the official professional credit of 'transmedia producer' in the United States, along with various transmedia funding schemes and similar processes in place within the European Union, such as the MEDIA program and its associated support networks in the member countries (Scolari and Ibrus 2014).

It is a subject that has fascinated many scholars of digital media over the last decade, but in an interview with Henry Jenkins (Provost's Professor of Communication, Journalism and Cinematic Arts at the University of Southern California), Kinder stated that these expansions can yield more than just revenue. She had "always been convinced that there's an important interplay between artistic experimentation and theoretical breakthroughs" (Jenkins 2015, p. 262).

Amongst others, she cites Marcel Proust's *A la recherché du temps perdu* (1922) as having inspired Gerald Genette's *Narrative Discourse: An Essay in Method* (1980) as being a relevant case in point. She goes on to explain how the friction created by having art and academia interact can open hitherto unexplored theoretical discussions. As a specialist in learning through participatory culture and public engagement Jenkins's research is distinct yet connected to this in being prolifically involved in linking academic researchers with the media industry, predominantly by developing new ways of thinking through old problems. He defines *transmedia* as being the flow of content through multiple platforms. It flows through multiple platforms because it is "a narrative so large, it cannot be covered in a single medium" (Jenkins 2006, p. 95).

He considers transmedia to be an ideal form for our modern era of 'collective intelligence', a phrase coined by Pierre Lévy in 1994 which refers to the impact of cyberspace upon society's relationship to knowledge and culture. Through the manner in which access has been widened by the Internet, Lévy asserts that we are moving from a position of isolation (the Cartesian model *cogito*, 'I think') to one as a collective (*cogitamus*, 'we think') (1994). The resulting collective knowledge space (a *cosmopedia*) dissolves the boundaries between disciplines into a patchwork within which any and all fields can knit and fold. A shared discourse then becomes an inevitable emergence. "Participants pool information and tap each other's expertise as they work together to solve problems . . . to form new knowledge communities. Transmedia narratives also function as textual activators – setting into motion the production, assessment, and archiving of information . . . [and reflecting] the economics of media consolidation or what industry observers call 'synergy'" (Jenkins 2007, paragraph 8).

As transmedia projects utilize a melange of different semiotic modes in order to reinforce one another; they are, thus, also a form of deep map where a mixture of associated agendas combine to further a single overarching harmony which speaks to a wider audience than each factor could attain on their own. Both are concerned with the reconstruction of knowledge through building story worlds, where 'story' refers to a narrative trajectory that is not static but are dynamic models of constantly developing situations (Ryan 2013).

With this exception, transmediality is generally concerned with representing what is usually a fiction through media-centric platforms. Whereas the notion of deep mapping does not differentiate between fact or fiction, arts or sciences and need not be constrained within any particular format. They nonetheless reflect different aspects of one another, they are "a trajectory, a constellation of shifting impulses – in many ways ultimately educational – rather than a unified set of technical approaches or a creative methodology . . . [they] work against the grain of disciplinary exclusivity, re-narrating the world in ways not pre-conditioned by the *realpolitik* of an epistemological *status quo* that maintains a culture of possessive individualism. It's for this reason that deep mapping cuts across the methods of the sciences and arts, playing with their relationship as a means to reconfigure social memory and place-identity. By activating testimonial imagination in response to the recovery of spectral traces of forgotten or untold pasts, deep mappings act educationally, critically bridging otherwise antagonistic positions and stories so as to provoke new understandings" (Biggs 2014, paragraphs 1 and 14).

'Provoking new understandings' is the lynchpin here. By altering our usual way of looking, we can remove the restrictive boundaries placed upon orthodox delineations, we can dissolve the fantasy of otherness and that allows for convention to be dismantled intellectually. A variety of agendas can therefore be accommodated across a single nexus of one text through a many worlds relation, or through one world across a many texts relation (Ryan 2013). In this, the term *world* is a little ambiguous, as it may refer to a set of context defined ontological properties by fiction or fact, or to a user-centric field of reference. Either way, it follows a Proppian notion (Propp 1968) of journeying 'to another kingdom' where one inhabits a different reality through the imagination.

This is essentially what the archaeologist does when interpreting a site or assemblage. We have a teleological code to which we adhere our imagination. We immerse ourselves in the conceptual landscape that we are uncovering with every spit and trench; building a world in our minds with every stone we move. With experience we bring a dearth of extra diegesis to aid, or hinder, our world-building view and we refer (and add to) the collective foreknowledge of landscape and archaeological historicity. The past people and places we encounter become personal, to the extent that we may succumb to the effect of 'fictional homelessness' when our research is completed, just as a gamer may feel when they return to their physical reality.

As the information we archaeologists produce rapidly becomes a web of sub-disciplines that can transcend the world of a dig, sometimes the dig itself can take on legendary status as its history is regenerated through every telling to the diggers who come after, or through media outputs such as television shows, social media, graphic novels and, again, even Minecraft.

However, to apply Tim Ingold's words from *Lines: A Brief History* (2007), their core is always directed down a trail-following method which is largely destination orientated, pre-determined by the funding agenda they are obliged to honour. Whereas transmedial and transfictional world building can go further than this. It can wayfare, where wayfaring is akin to sailing with no pre-ordained direction, free to anchor in whichever harbour presents itself.

This is a little tricky to present in a funding bid as it is quantifiable only in retrospect. It does not entirely follow a checklist of pre-determined aims and objectives, and neither does it fit comfortably into a time scale. When applied to archaeology, this can allow for an opening of both expression and method that leads one away from the conventional sources of funding and into dangerous waters where art and science meet. Geomythology sits as a bridge across this water, with the geomythologist balancing carefully upon its wire (Figure 10.8).

Academic and non-academic sectors can take an equal stand. Science can hold hands with story – BUT, this requires a radical reappraisal of how we finance and supervise research, for it does not fit neatly into our long-established boundaries. Whilst funding bodies and institutions may claim to want to be interdisciplinary and devoid of ivory towers separating insiders from outsiders, when it actually comes to directing the money or devising marking strategies, the practical implications of spreading over, say, 11 different departments results in a rapid reversal of enthusiasm.

We, therefore, don't need to just deep map a physical landscape, or express our story transmedially. We need to deep-map an entire academic perspective. For surely, one of the values of archaeology is its ability to cross-pollinate and position itself as a conduit for changing perceptions in landscapes of both the ground and of the imagination? Geomythology is a prime example of this. Archaeological representation has a track record of being able to

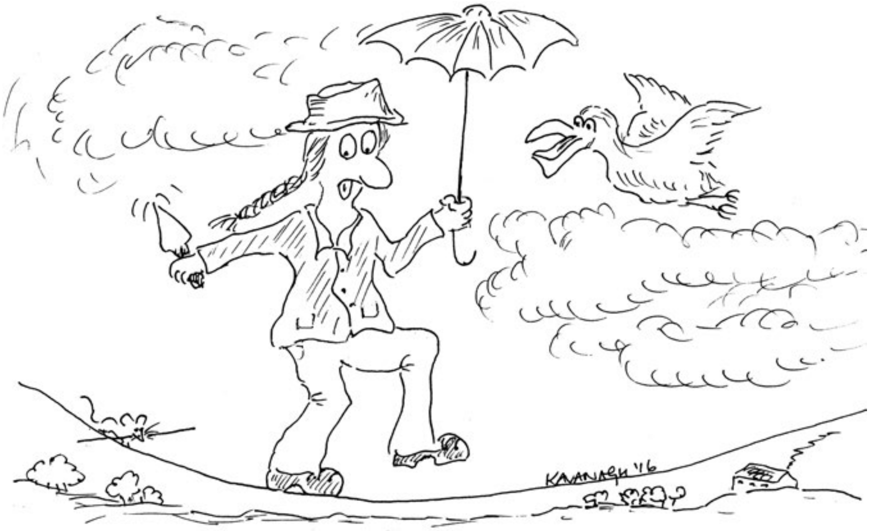


Figure 10.8 The Geomythological High Wire – Copyright: Erin Kavanagh 2016.

regenerate old narratives and visual form to suit a more-enlightened century, redefining knowledge production and gradually reconstructing power alliances (Moser 2003, 2014). So we are not without hope, even though it is not easy to navigate the political minefield of ploughing up outmoded ways of thinking.

For geomythology, this ploughing involves convincing geoscience that stories are not merely the fanciful wanderings of overactive poesy that occasionally gets detail 'right' and convincing storytellers that science is not just the dry dungeon of Spock-like insensitivity. It also requires coercing other disciplines to share their space. Room has to be made within academic thinking for modes of presenting research that do not fit within traditional structures. It also involves convincing funding bodies that stories are more than just puppets for public engagement, to be tacked on the end of projects in order to tick a box indicating community awareness. They are a method and a portal in their own right, just as science can be utilized to trigger a storytelling bonanza, with or without a hat and whip.

Layers

"Deep mapping can be looked upon as an embodied and reflexive immersion . . ." concluded Les Roberts in the preface to *Deep Mapping, a Special Issue of Humanities* (2016, p. 14). I concur, for this is exactly what seven of us did when developing the POC pilot *Y Bont/The Bridge* into a process of transmedially deep-mapping of the wider locale of Cardigan Bay. The ISRF, who had supported Nishat Awan, awarded us a flexible small project grant in order to facilitate this endeavour. This public benefit foundation seeks to fill the gap in social science that traditional funding bodies leave behind, promoting "independent minded researchers to explore and present original research ideas which take new approaches and suggest new solutions . . ." (ISRF 2016a); they are pioneering a new approach to funding criteria.

This innovation enabled my previous team to dive a step or two further into experiential experimentation, working together on two field days; the first in Borth and the second at Tan-y-Bwlch, both on the Ceredigion coast. Our aim was "to form a new understanding regarding the interplay of flooding facts and fictions through the layering of time" (ISRF 2016b, paragraph 2).

The first field day saw us sharing our various knowledge streams concerning the land and seascape in question. This covered the deluge tales held in local memory, the extant literature in Middle Welsh and Irish, folk songs, myth and geoscience. Martin Bates (geoscience and archaeology) opened by sharing how he approaches a scientific understanding of space, place and time and it rapidly became apparent that he starts, and ends, with pictures – which we immediately realised was a unifying factor amongst the group. We walked along the beach as he explained what we could see from his perspective; the peats and sediments, traces of earlier channels, Bronze Age foot and hoof prints, fish traps and, of course, the submerged forest.

Debate was lively, as was the weather. The sky hung heavy and the spray bit as Jacob Whittaker (artist and film maker) lugged his camera equipment over the slippery ground. Recording conversations was tricky in those conditions, but he did manage to snatch some key moments of explanation, interaction and creative practice, ably assisted by Peter Stevenson (story teller and illustrator), who hung onto the boom with frozen fingers (Figure 10.9). Maria Hayes (artist and illustrator) also battled the elements as she attempted to sketch the desolate tree stumps with ink and parchment. Lynne Denman (heritage interpreter and singer) translated some of Martin's specialist lingo into everyday speech and sang to the waves of mermaids and loss. Diarmuid Johnson (philologist and musician) dodged the paper problem and wrote directly on the sand, inscribing quotations from Cad Goddeu/The Battle of the Trees (Evans 1910) overspun with the theme of peace (*Hedd*) to symbolise our synergy. I took stills and moved between everybody, attempting to keep out of their way as they found their own harmonies in the wind.

This first day set everyone up to then go and work either separately or in partnerships, as they chose, responding to what they had experienced in witnessing each other's process. With sound recordings to aid memory as to what we had each agreed to deliver and an online file into which they

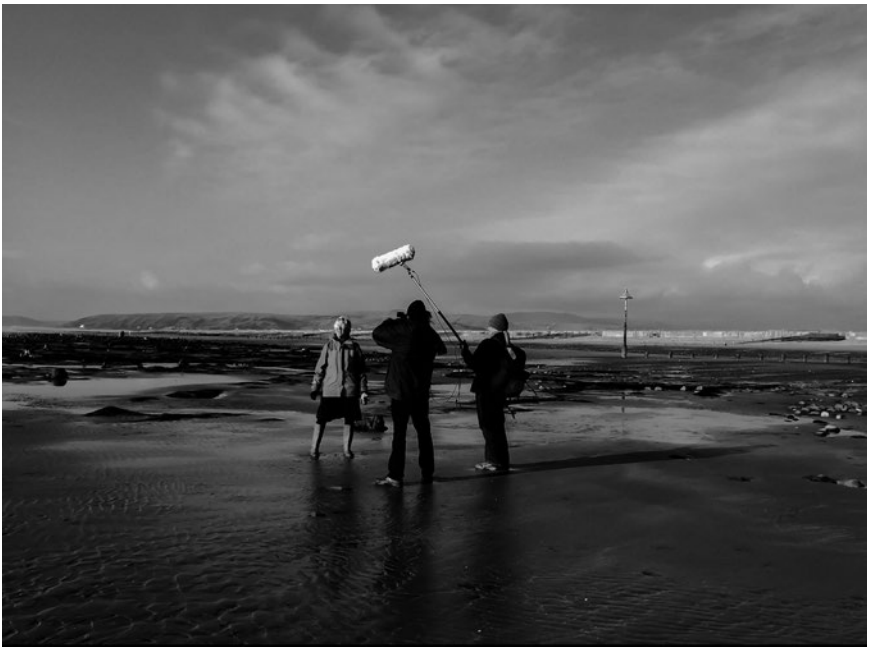


Figure 10.9 Lynne Denman, Jacob Whittaker and Peter Stevenson filming on Borth Beach – Copyright: Layers 2016.

could place creations, I waited. Drawings were the first to arrive; collages and montages of medieval script with sketched trees. Stacks of scientific data flooded the account. I provided more stills than a gallery. Other contributors were quieter, some needed regular reassurance regarding what our remit was because the coherency which was so tangible when all together became more ephemeral upon finding oneself working alone. That crisis of confidence was what I was looking for, however, for it is in those moments that people find the cracks in their own thinking and expansion can occur. That is where reflexivity is sown.

Out of these fissures came the second field work day.

The climate was kinder than before as Martin took geo-archaeological samples via auger and test pit, assisted in the technical work by me and the physical labour by Diarmuid, who had never engaged with such activity before. Peter sketched the proceedings, maintaining a steady sharing of information by way of questions and listening (Figure 10.10). Jake and I continued to record it all by film and photographs.

Meanwhile, Maria was ensconced by a small bridge, painting (Figure 10.11). Painting portraits of a set of antlers which had recently been found by visitors from Birmingham, Julien Culham and Sharon Davies-Culham, in the shallows at Borth. Julien and Sharon had reacted to their discovery in textbook style; leaving it *in situ*, taking photographs and contacting the relevant authorities. Martin had returned to the site and uncovered the find, which was curiously in roughly the same place where the remains of an auroch had been found in the 1960s. They had then gone to the labs at University of

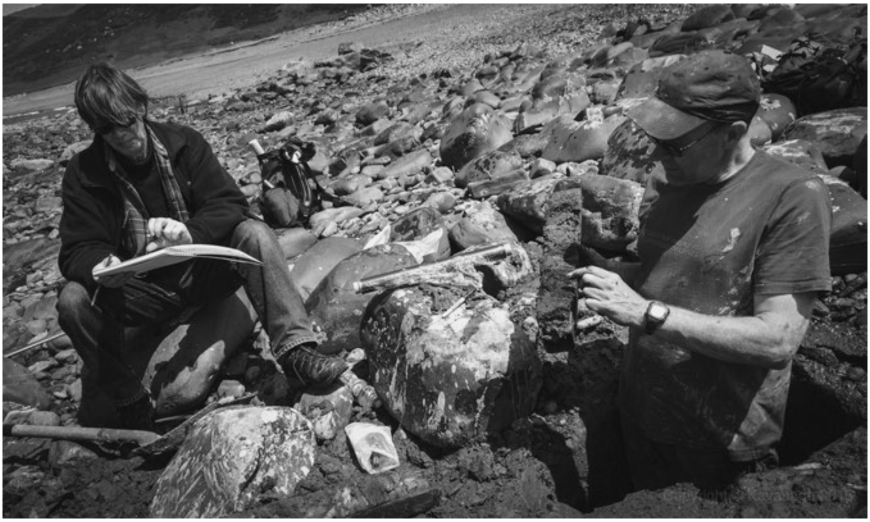


Figure 10.10 Dr. Martin Bates, explaining the stratigraphy at Tan-y-Bwlch, to Peter Stevenson, who is also drawing the whole process – Copyright: Layers 2016.

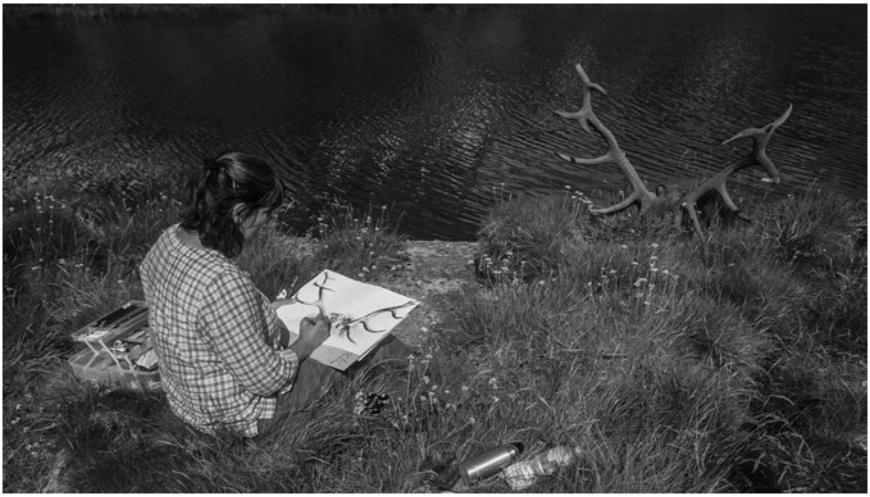


Figure 10.11 Dr. Maria Hayes painting the Borth antlers at Tan-y-Bwlch – Copyright: Layers 2016.

Wales Trinity Saint David for cleaning and sampling, producing a subsequent radiocarbon date in the Middle Bronze Age. These antlers, belonging to an Imperial red stag, immediately grasped public attention. They also gradually took over directing the remaining course of our trajectory.

Influenced also by various other projects that occurred throughout the ensuing months, sitting next to a photograph of the antlers, I began to write up all the data we had gathered into a myth. A myth that was also a poem. A poem that was also a timeline. A timeline that was also a story about flooding, about a changing world and lost inhabitants. The protagonist was a creature who guarded that liminal space between land and sea. He wore antlers as a crown, had cloven hoofs (which tied in with the aforementioned hoof prints imprinted in peat and clay), the body of an auroch. He fitted the description Peter had given of a creature who guarded the folk lore land of Plant Rhys Ddwfn, a utopia out on the Ceredigion horizon. His manner of tale telling opens after the form by William Shakespeare in *The Merry Wives of Windsor* (Craig 1914; Act 4, Scene 4) and concludes after Ariel's speech in *The Tempest* (Act 3, Scene 3), also Shakespeare. In-between, it follows Taliesin, with echoes of other poets (such as Dafydd ap Gwilym, Llywerch Hen, W.B. Yeats and R.S.Thomas) reverberating in the lines.

Maria and Peter took this myth-poem, 'King of the Sea Trees', along with the scientific timeline and shut themselves away in the studio. Their idea was to see if they could create a line of artwork that expressed their understanding of this information, the direct experience of handling the artefacts, of walking the space, of hearing the past languages spoken and sung. As ever, Jake was behind a lens, recording. Having never worked closely together (none of the team had interacted as a whole during the previous film's inception), and being from very different traditions this combination was, in its own way, as unique as Martin and Diarmuid had been when both hauling on an auger. The result was a most beautiful scroll of cave painting-like animals, early people, glaciers and meltwater dancing across 120,000 years as the paper became the Cardigan Bay we know of today and are visualising into the past (Figure 10.12). More critically, for our purposes, the result was also a piece of footage which realizes deep-mapping in process (see: *Layers in the Landscape* 2017).

During and since then, a variety of offshoots have arisen *en route*. We have experimented with a heritage information panel that reflects the various layers, along with an abstract thin map of the deep map (Figure 10.13). The art'chaeology element has begun to inform projects elsewhere, including within education (Kavanagh 2016), and opportunities for tourism-related activities are being implemented in conjunction with Visit Wales's marketing strategy which names 2017 'The Year of the Legend' and 2018 'The Year of the Sea'. Performances have occurred; wayfaring with 'King of the Sea Trees', stories and song as part of series of science walks by the bay. Other artists have joined in the play, with Emily O'Reilly recording the sound of our walked performances and then weaving it into a textile piece called 'Oscillate' (O'Reilly

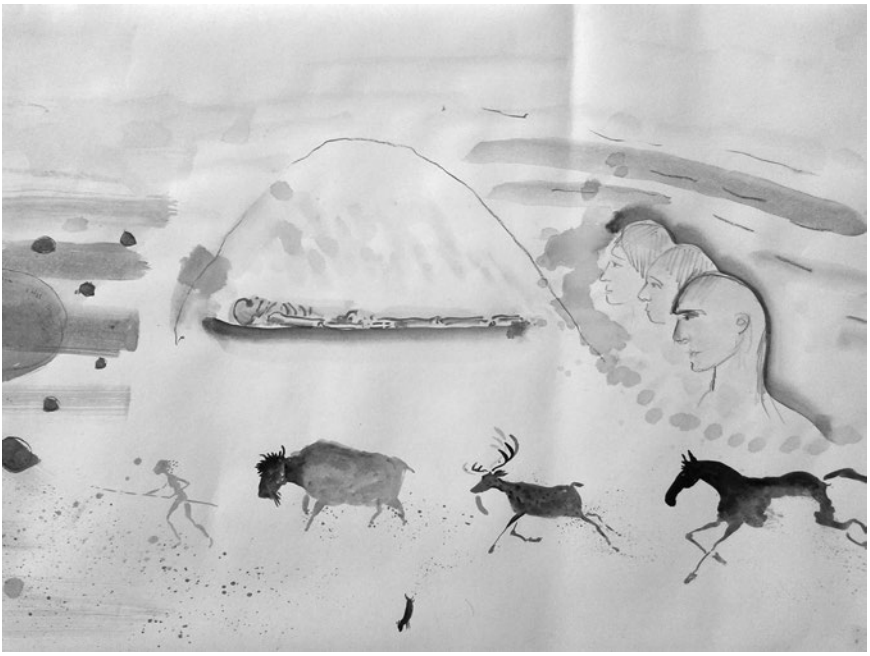


Figure 10.12 A test draft of a thin deep map, Cardigan Bay, West Wales – Copyright: Layers 2016.

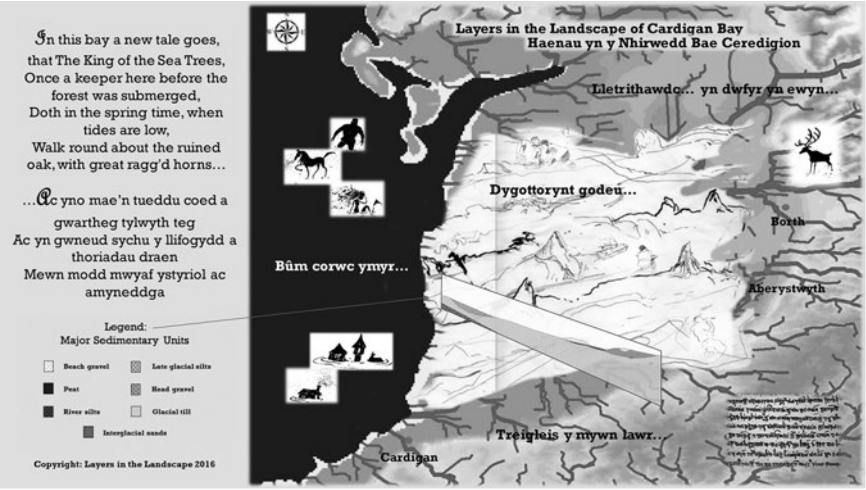

In this bay a new tale goes,
that The King of the Sea Trees,
Once a keeper here before the
forest was submerged,
Doth in the spring time, when
tides are low,
Walk round about the ruined
oak, with great ragg'd horns…
…Ac yno mae'n tueddu coed a
gwartheg tylwyth teg
Ac yn gwneud sychu y llifogydd a
thoriadau draen
Mewn modd mwyaf ystyriol ac
amyneddga
Legend:
Major Sedimentary Units
Beach gravel
Late glacial silts
Peat
Head gravel
River silts
Glacial till
Interglacial sands
Copyright: Layers in the Landscape 2016
Layers in the Landscape of Cardigan Bay
Haenau yn y Nhirwedd Bae Ceredigion
Lletrithawdc… yn dwfyr yn ewyn…
Dygottorynt godeu…
Bûm corwc ymyr…
Borth
Aberystwyth
Treiglеis y mywn lawr…
Cardigan

Figure 10.13 Layers in the Landscape, a single frame of a deep map – Copyright: Layers 2016.

2016). I responded to that with a photograph of the shoreline that reflected her colours and layering, she is now weaving a response back – and so it continues.

At the time of writing, Jake and I have just completed putting all of this together into the video narrative we promised the ISRF. We have stepped back from presenting a product and instead have concentrated solely upon the intra-action of mapping layers. Upon process – and process upon sharing – becomes synthesis (Snow 1959).

I cannot, or rather will not, speak for the rest of the team. However, for myself, what I have uncovered through this project is that working with a mixture of disciplines and a mixture of academics and non-academics, of institutionally trained thinking and intuition, of art and science, is really no different to working with any combination of individuals. The same challenges of personality and circumstance, skill and time, comprehension and commitment, terminology and patience abound. All that is different is that extenuated effort has to be made to listen most carefully to one another, to be additionally considerate, to take care with how language and power are used. One is brought up close to one's own manner. There can be no assumptions based upon shared praxis. This level of transparency can make some people supremely uncomfortable, others it will inspire.

Was it easy? No. Was it difficult? No. It was . . . and still is . . . immersive. Letting go of producing a product allows one a freedom that I found to be reminiscent of Ascher's stop-motion animation. However, working with so many other people from distinctly different positions also brings the very restrictions that Ascher was opting away from, in that it demands that at least one individual become conceptually multi-lingual so as to be able to hold all the disparate elements together – when those disparate elements are other people. At least one person has to, therefore, become fully in trust to the others, at their mercy – to take on the liminality without fear of over control but also without losing hold of the reins. Not unlike theatre direction. Overall, it allows people to rethink their own internal dialogues, how they position themselves (and each other and their genres) in the broader map of the sociological imagination (Mills 2000). Individual quirks are emphasized, challenges which could usually be swallowed by disciplinary convention and speed of delivery become more clearly seen. Similarities are obvious. A little like walking, rather than travelling by car, moments are felt more keenly. This was not a journey of speed or sophistication, it was a journey of stumbles and new perspectives sought from fallen positions. I learned to look a little more clearly with other people's eyes, consequently my mental map of where I live is now enriched with their vision.

Conclusion

As with psychogeography (Débord 1955; Self and Steadman 2007), the very essence of deep-mapping almost evaporates under the weight of attempts to pin it down into a static definition (Biggs 2014). This makes explaining it to people who are not yet INSIDE the map, in a paper such as this one, an inherently partial exercise. This is because both psychogeography and deep mapping are about movement; they are "not a static relationality but a doing – the enactment of boundaries – that always entails constitutive exclusions and therefore requisite questions of accountability" (Barad 2003, p. 803). What was becomes what is, what is becomes what isn't; all can be reversed in an instant; at some points the detail is microscopically precise and at others it balloons into a broad generalisation. Whereas deep-mapping is concerned with the layers of influence and expression, psychogeography is concerned with exploring how the environment has a psychological influence and the psychology, in turn, has an environmental influence. Both seek to destabilise habitual patterns, to explore without direction, to uncover that which is often overlooked. They are not destination driven and as such can remove more signposts than they lay down. However, psychogeography is urban centric, whereas deep-mapping makes no delineation between the urban and the rural. It isn't focused on people, it's focused on the land *and* the landscape; on the accountable layering of stories.

McLucas attempted to offer a structure of tenets by which to guide, or explain, the *doing* of this in order to counter the dilemma (McLucas, no date). Thus, here I shall conclude by responding to them in the light of the experiences I have hitherto cited, in the hope that they may clarify possible remaining questions in the minds of any reader – and also that they may offer some insight into what it is like to wear a deep map like a shared diving suit.

i. "Deep maps will be big" – The intellectual space created by bringing together multiple disciplines is inherently big. The deep mapper needs to not be fazed by how to navigate through such largesse. Not all potentiality has to be immediately realised. To be confident enough to allow natural developments within each field and within each combination of fields whilst being sufficiently ruthless as to be able to extract only that which is immediately resonant is how balance is maintained.

ii. "Deep maps will be slow" – Do not hurry. The need for full immersion is paramount and can only come with, and be actualised by, time in a manner not dissimilar to situated knowledge. Individuals will not work at a uniform speed, they are developing their own, independent, collaborations with each other and the location in the act of joint and sole creation. The unfolding of relationships cannot be fast tracked. Each will flourish at their own pace and to their own criteria, regardless of what they may promise at the outset. However swift and connected certain harmonies may be, the overall choir can only travel at the speed of its slowest components.

iii. "Deep maps will be sumptuous" – The richness of multi-layered orchestration is what creates this sumptuousness. Guarding against oversaturation has to be carefully conducted, for 'loud and complicated' is not the same as 'deep and resonant.' The flavours can clash but need to do so in a way that is effective; this unified tension is the polyphony.

iv. "Deep maps will only be achieved through the articulation of a variety of media" – Transmediality, rather than multimediality, is perhaps advisable because the latter requires a reliance upon digital technology that is not actually essential.

v. "Deep maps will have at least three basic elements . . .[and] an archival system that remains open and unfinished." – Three levels are the minimum required to make a map more than two-dimensional. However, this can be in the form of two active and one passive. This makes the actualizing a little smaller and thus more manageable, piece by piece. One deep map will have many roads that fall off the edge it itself creates, these roads can be picked up at any future point (or simultaneously) into another direction. In stepping back from product and concentrating upon actualising process potentiality becomes exponential.

vi. "Deep maps will require the engagement of both the insider and outsider" – It is not insular, although the participants themselves may be. Being seen from outside of one's normativity is how edges are clarified.

vii. "Deep maps will bring together the amateur and the professional, the artist and the scientist . . ." – Deep maps are unifying. Ideas of status become nonsensical because everybody is an expert regarding their own perspective.

viii. "Deep maps might only be possible and perhaps imaginable now" – There is an over-arching 'present' in a deep map that dissolves notions of time. Digital media certainly helps to facilitate a unity within such a dreamlike position but other mediums are also hugely flexible when it comes to manipulating reality, such as performance and poetry.

ix. "Deep maps will not seek the authority and objectivity of conventional cartography. They will be politicized, passionate and partisan. They will involve negotiation and contestation over who and what is represented and how. They will give rise to debate about the documentation and portrayal of people and places" – This is the *doing* of deep mapping, rather than the technique, which is what the previous tenets addressed. It is the inevitable result of applying the technique.

x. "Deep maps will be unstable, fragile and temporary. They will be a conversation and not a statement" – Embrace the fragility, allow oneself to become unstable in the security of combined focus. Process is a coming-into-being that is rarely without pain. It is also temporary.

"The archaeological imagination is rooted in a sensibility, a pervasive set of attitudes toward traces and remains, towards memory, time and temporality, the fabric of history" (Shanks 2012, p. 25). The archaeological imagination lends itself fluently to mapping, be it deeply or otherwise. Archaeology's role is to expose that which is hidden, to address fact and fiction with equal analysis, to study layers in the landscape. Whilst my films are themselves completed, the deep map to which they adhere (and contain) is still very much a work-in-progress and may never, actually, be finished – but that doesn't matter, for such apparatus "are inherently unstable, continually unfolding and changing in response to new data, new perspectives and new insights" (Bodenhamer et al. 2015, p. 4). The 'world as it is' in which we live does not stand still, it does not pose for a cartographic portrait that will remain true beyond a mere moment. It is forever in flux. It flows like a river beneath the bridge on which our thinking stands, a river into which we can never step twice. Therefore, instead of becoming lost in the flood we have to either be carried passively like driftwood or be active in our sailing, to lead change by joining forces, to bridge the self-imposed disciplinary divides.

"Foucault points out that juridical systems of power produce the subjects they subsequently come to represent. Juridical notions of power appear to regulate political life in purely negative terms . . . . But the subjects regulated by such structures are, by virtue of being subjected to them, formed, defined, and reproduced in accordance with the requirements of those structures" (Butler 1990, p. 2).

This is that folding-within of definitions we encountered. I, therefore, suggest that if this is so, then let us step out of the grid (Maher 2014), build a new world in which the structure is in accordance with our collective intelligence, bridging divisions together. Let us redesign the map.

Filmography

Cycle (1986) Dir. Robert Ascher, USA, 5mins.

Bar Yohai (1988) Dir. Robert Ascher, Israel, 6mins.

Blue. A Tlingit Odyssey (1991) Dir. Robert Ascher, USA, 6 mins.

The Golem (1995) Dir. Robert Ascher, USA, 4 mins.

Y Bont/The Bridge (2015) Dir. Erin Kavanagh; Prod. Jacob Whittaker, Wales, 3.45 min. www.youtube.com/watch?v=xh5dhOoCrec

Layers in the Landscape (2017) Dir. Erin Kavanagh; Prod. Jacob Whittaker, Wales, 20 mins. In "Erin Kavanagh, A 'Modern'Antiquarian," www.geomythkavanagh.com/layers-in-the-landscape

Secret of the Incas (1954) Paramount Pictures, USA, 98 mins.

Raiders of the Lost Ark (1981) Paramount Pictures, USA, 115 mins.

References

Ascher, R. (1981). Myth and Film. In J.R. Rollwagen (Ed.), *Anthropological Film and Video in the 1990's*. (1993). (pp. 67–75). Brockport, NY: Institute Press.

Ascher, R. (1987). Cycle: A cameraless animation film: Commission on visual. *Anthropology Newsletter*, May, 27–28.

Ascher, R. (1990). Approach, theory and technique in the making of Bar Yohai. *Visual Anthropology*, 3, 111–119.

Awan, N. (2016). Migrant narratives of citizenship: A topological atlas of European belonging. www.gasp.group.shef.ac.uk/research/migrant-narratives-of-citizenship/ Accessed on 9 Sept 2016.

Bailey, G. (2007). Time perspectivism: Origins and consequences. *Journal of Anthropological Archaeology*, 26 (2), 198–223.

Bakhtin, M.M. (1981). *The dialogic imagination: Four essays*. C. Emerson, M. Holquist (Eds.), Austin and London: University of Texas.

Bakhtin, M.M. (1984). *Problems of dostoevsky's poetics*. C. Emerson (Ed., Transl.). Minneapolis: University of Minnesota Press.

Barad, K. (1999). Agential realism: Feminist interventions in understanding scientific practices. In M. Biagioli (Ed.), *The science studies reader* (pp. 1–11). New York: Routledge.

Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Sign: Journal of Women and Culture in Society*, 28 (3), 801–831.

Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.

Bender, B. (1998). *Stonehenge making space*. Oxford: Berg.

Biggs, I. (2014). www.iainbiggs.co.uk/2014/10/deep-mapping-a-partial-view/ Accessed on 12 Sept 2016.

Bodenhamer, D.J., Corrigan J., Harris, T.M. (Eds.) (2015). *Deep maps and spatial narratives*. Bloomington and Indianapolis: Indiana University Press.

Butler, J. (1990). *Gender trouble: Feminism and the subversion of identity*. London: Routledge, Chapman and Hall.

Caldwell, R.S. (1987). *Hesiod's Theogeny: Focus Classical Library*. Newburyport, MA: Focus Information Group.

Craig, W.J. (Ed.) (1914). *The complete works of William Shakespeare* (1st ed.). Oxford: Oxford University Press.

Cohn, D. (1999). *The distinction of fiction*. Baltimore: Johns Hopkins University Press.

Davies, S. (Transl.) (2007). *The Mabinogion*. New York: Oxford World's Classics, Oxford University Press.

Débord, G. (1955). Introduction to a critique of urban geography. In H. Bauder, S.E.D. Mauro (Eds.), *Critical geographies: A collection of readings* (pp. 23–27). K. Knabb (Transl.). (2008). Praxis (e) Press. English edition. www.praxis-epress.org/CGR/CG_Whole.pdf Accessed on 6 Sept 2016.

Deetz, J. (1988). History and archaeological theory: Walter Taylor revisited. *American Antiquity*, 53 (1), 13–22.

Ethington, P.J., Toyosawa, N. (2015). Inscribing the past: Depth as narrative in historical spacetime. In D.J. Bodenhamer, J. Corrigan, T.M. Harris (Eds.), *Deep maps and spatial narratives* (pp. 72–101) (97). Bloomington and Indianapolis: Indiana University Press.

Evans, J.G. (Transl) (1910). *The book of Taliesin*. Llanbedrog.

Fagles, R. (Transl) (1990). *Homer, the Iliad*. New York: Penguin Books.

Gazin-Schwartz, A., Holtorf, C. (Eds). (1999). *Archaeology and folklore*. London and New York: Routledge.

Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.

Genette, G. (1980). *Narrative discourse: An essay in method*. Ithaca, NY: Cornell University Press.

Genette, G. (1988). *Narrative discourse revisited*. Ithaca, NY: Cornell University Press.

Genette, G. (1991). *Fiction et diction*. Paris: Seuil.

Godin, M., Doná, G. (2016). Refugee voices. *Refuge, Canada's Journal on Refugees*, 32, 60–71.

Haynes, J.R., Kiteley, R.J., Whatley, R.C., Wilks, P.J. (1977). Microfaunas, microfloras and the environmental stratigraphy of the late glacial and Holocene in Cardigan Bay. *Geological Journal*, 12, 129–158.

Hedges, C. (2011). *The world as it is: Dispatches on the myth of human progress*. New York: Nation Books.

Heise, U.K. (2014). http://stateofthediscipline.acla.org/entry/comparative-literature-and-environmental-humanities Accessed on 12 Sept 2016.

Hodder, I. (1999). *The archaeological process: An introduction*. Oxford: Wiley-Blackwell.

Holloway, I. (1997). *Basic concepts for qualitative research*. London: Blackwell Science.

Ingold, T. (2007). *Lines: A brief history*. London: Routledge Classics.

ISRF (2016a). www.isrf.org Accessed on 4 Sept 2016.

ISRF (2016b). www.isrf.org/about/fellows-and-projects/fg2-7/ Accessed on 4 Sept 2016.

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: New York University Press.

Jenkins, H. (2007). http://henryjenkins.org/2007/03/transmedia_storytelling_101.html Accessed on 4 Sept 2016.

Jenkins, H. (2015) http://henryjenkins.org/2015/03/wandering-through-the-labyrinth-an-interview-with-uscs-marsha-kinder-part-two.html Accessed on 4 Sept 2016.

Joyce, R. (2002). *The languages of archaeology: Dialogue, narrative and writing*. Oxford: Wiley-Blackwell.

Kavanagh, K.E. (2015). *Of myth and man: Essaying the space-between in geomythological theory*. Unpublished thesis. Lampeter: University of Wales Trinity Saint David. DOI: 10.1080/00155870701806233

Kavanagh, K.E. (2016). Art'chaeology. www.geomythkavanagh.com/art-chaeology Accessed on 30 Sept 2016.

Keene, M. (2015). *Science in wonderland*. Oxford: Oxford University Press.

Keysar, H. (2016). https://micromag.evidenceandinfluence.org/article/mapmaking-in-jerusalem/ Accessed on 10 Sept 2016.

Kinder, M. (1991). *Playing with power in movies, television, and video games: From Muppet Babies to Teenage Mutant Ninja Turtles*. Berkeley, CA: University of California Press.

Langer, S., Knauth, K. (1953). *Feeling and form: A theory of art*. New York: Scribner.

Lévy, P. (1994). *L'Intelligence collective. Pour une anthropologie du cyberspace*. Paris: La Découverte.

Maher, S.N. (2014). *Deep map country, literary cartography of the Great Plains*. Nebraska: University of Nebraska Press.

Mayor, A. (2004). Geomythology. In R. Selley, R. Cocks, I. Plimer (Eds.), *Encyclopedia of geology* (pp. 143–83). Oxford: Elsevier.

McLucas, C. (N.d.). http://cliffordmclucas.info/deep-mapping.html Accessed on 12 Sept 2016.

Mickel, A. (2015). Archaeology's epic battles with storytelling and stereotypes. *Norwegian Archaeological*, 48, 81–84.

Mills, C. (2000) *The sociological imagination*. New York: Oxford University Press.

Moser, S. (2003). Representing human origins: Constructing knowledge in museums and dismantling the display canon. *Public Archaeology*, 3 (1), 3–1.

Moser, S. (2014). Making expert knowledge through the image: Antiquarian images and early modern scientific illustration. *Isis*, 105, 58–99.

Nunn, P.D. (2012). Of giant fish and shaken islands: Geological interpretations of euhemeristic myths concerning underwater eruptions and abrupt island movements in the Pacific islands. *Australian Folklore*, 27, 27–36.

Nunn, P.D. (2014a). Lashed by sharks, pelted by demons, drowned for apostasy: The value of myths that explain geohazards in the Asia-Pacific region. *Asian Geographer*, 31, 59–82.

Nunn, P.D. (2014b). Geohazards and myths: Ancient memories of rapid coastal change in the Asia-Pacific region and their value to future adaption. *Geoscience Letters*, 1, 3.

O'Reilly, E. (2016). www.melinbryn.co.uk Accessed on 12 Sept 2016.

Pearson, M., Shanks, M. (2001). *Theatre/archaeology: Aisciplinary dialogues*. London: Routledge.

Piccardi, L., Masse, W.B. (2007). Myth and geology. *Special Publications*, London: Geological Society, 273, 9–28.

Pluciennik, M. (2015). Authoritative and ethical voices: From diktat to the demotic. In R.M. Van Dyke, R. Bernbeck (Eds.), *Subjects and narrative in archaeology* (pp. 55–81). Boulder: University Press of Colorado.

Propp, V. (1968). *Morphology of the folktale*. Second Edition. Austin: University of Texas Press.

Proust, M. (1922). *À la recherche du temps perdu*. Paris: Nouvelle Revue Francaise.

Public Lab (2015). https://publiclab.org/profile/hagitkeysar Accessed on 4 Sept 2016.

Ramey, K. (2014). Do no harm: The cameraless animation of Anthropologist Robert Ascher. In A. Schneider, C. Pasqualion (Eds.), *Experimental film and anthropology* (pp. 97–112). London and New York: Bloomsbury Publishing.

Rathje, W.L., Shanks, M., Witmore, C. (2013). *Archaeology in the making: Conversations through a discipline*. Abingdon and New York: Routledge.

Ricoeur, P. (1983). *Time and narrative (Temps et Récit)*, 3 vols. K. McLaughlin, D. Pellauer (Transl.). Chicago: University of Chicago Press.

Roberts, L. (2016). Deep mapping: Printed edition of the special issue published in Humanities. Switzerland, MDPI. www.mdpi.com/journal/humanities/special_issues/DeepMapping Accessed on 3 Sept 2016.

Ryan, M.-L. (2013). Transmedial storytelling and transfictionality. *Poetics Today*, 34 (3), 361–388.

Ryle, G. (1949). *The concept of mind*. London: Hutchinson.

Scolari, C.A., Ibrus, I. (Eds.) (2014). Transmedia critical: Empirical investigations into multiplatform and collaborative storytelling. *International Journal of Communication*, 8, 2191–2200.

Self, W., Steadman, R. (2007). *Psychogeography: Disentangling the modern conundrum of psyche and place*. New York: Bloomsbury.

Shanks, M. (2012). *The archaeological imagination*. Walnut Creek, CA: Left Coast Press.

Shanks, M., Svabo, C. (2013). Archaeology and photography: A pragmatology. In A. Gonzalez-Ruibal (Ed.), *Reclaiming archaeology: Beyond the tropes of modernity* (pp. 89–102). London: Routledge.

Shi, Z., Lamb, H.F. (1991). Post-glacial sedimentary evolution of a micro-tidal estuary, Dyfi Estuary, West Wales, UK. *Sedimentary Geology*, 73, 227–246.

Sigona, N. (2014). The politics of refugee voices: Representations, narratives and memories. In E. Fiddian-Qasmiyeh, G. Loescher, K. Long, N. Sigona (Eds.), *The Oxford handbook of refugee and forced migration studies* (pp, 369–382). Oxford: Oxford University Press.

Snow, C.P. (1959). The two cultures and the scientific revolution. In *The Rede Lecture*. New York: Cambridge University Press.

Vitaliano, D. (1968). The impact of geologic events on history and legend with special reference to Atlantis. *Journal of the Folklore Institute*, 5, 5–30.

Vitaliano, D. (1973). *Legends of the earth: Their geologic origins*. Bloomington: Indiana University Press.

Vitaliano, D. (2007). Geomythology: Geological origins of myths and legends. *Geological Society, London, Special Publications*, 273, 1–7.

White, H. (1987). *The content of the form: Narrative discourse and historical representation*. Baltimore: The Johns Hopkins.

11 Mapping sound

Creating a static soundscape

Dianne Scullin

> "In the cartographic world . . . all is still and silent."
>
> (Ingold 2000: 242)

Introduction

This chapter explores the consequences, both intended and unintended, of transforming sound into visual representation, specifically through the process of acoustic mapping. An acoustic map presents the changing intensity of sound as it moves through space from a fixed source. The lighter gray areas of Figure 11.1 indicate where a listener could hear the sound the loudest, and the darker grays where the sound became barely audible. Creating acoustic maps allows archaeologists to access and to analyze past soundscapes with the aim of achieving a greater understanding of past experiences and actions. It succeeds in this endeavor in the same fashion that the gaze always does: through exposure. The acoustic map renders normally invisible soundwaves highly visible, asserting sound as an active force within space, but paradoxically presenting sound as static and silent. This exposure reveals new avenues of inquiry concerning the experience and impact of sound, both in the past and the present, but this exposure also subjugates sound to sight. The acoustic map displays the surveillance of sound, and all that this concept entails. Acoustic maps do demonstrate that archaeologists can investigate ephemeral phenomena, such as sound in the past, and accomplish this in an objective, rigorous and replicable way. Yet if visual representation acts as the only avenue via which archaeologists can access sound in the past, are we really any closer to understanding the multi-sensory lived experience of past people? Does mapping sound simply extend the ways and forms through which we project our own visual bias onto the past, a past containing people who may have had vastly different sensory ways of knowing and ordering the world?

This chapter outlines how the acoustic map functions as archaeological evidence, why archaeological practice necessitates the transformation of sound into image for analysis, and what gains and losses occur during this translation process. Maps act as material witnesses to measurable

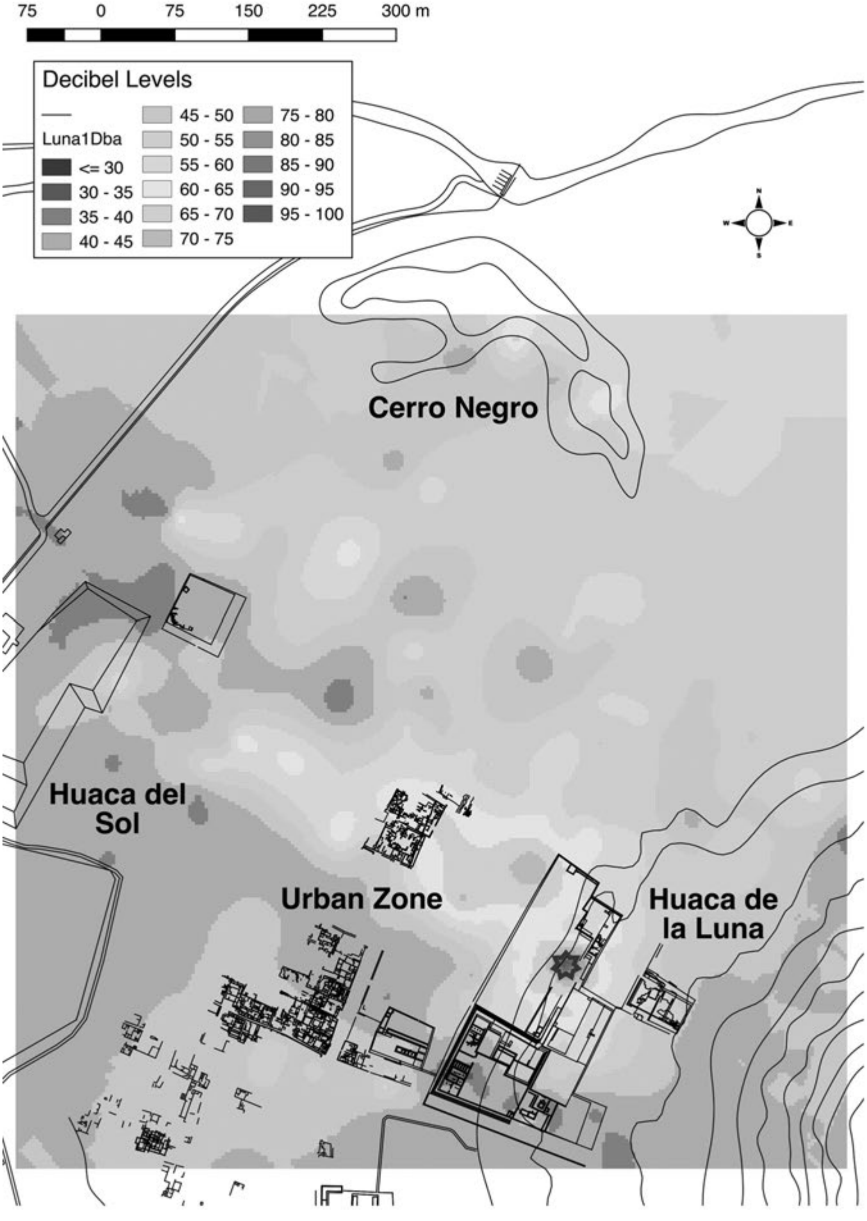

75
0
75
150
225
300 m
Decibel Levels
Luna1Dba
<= 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
85 - 90
90 - 95
95 - 100
N
W
E
S
Cerro Negro
Huaca del Sol
Urban Zone
Huaca de la Luna

Figure 11.1 Huaca de la Luna high-frequency map. The star represents the speaker location.

phenomena, more objective, and therefore trustworthy, than the subjective observations of human beings and individual experiences. The acoustic map presents itself as an objective source of archaeological evidence, legitimizing the study of sound by archaeologists through the utilization and expansion of the foundational method of plan-view map making. Transforming the ephemeral and invisible into something durable and material, the acoustic map allows considered analysis and comparison. A presentation of acoustic mapping methods followed by a general discussion of cartographic practices and how these relate to archaeology will articulate what an acoustic map attempts to accomplish. A case study of the Moche (AD100–850) urban site of Huacas de Moche and a following discussion of this analysis will expose both the limitations and advantages of employing an acoustic map as a source of data concerning the experience of sound in the past. Despite its many disadvantages, acoustic mapping does increase the validity of sound studies within archaeology by providing comparable data utilizing replicable methods. It allows for the detailed examination of a variety of sonic experiences, such as estimating audience size and acoustic space[1] or evaluating degrees of performance accessibility. The acoustic map provides a necessary foundation for investigating and comparing a generalized human experience of sound in the past, but fails to convey the physical or psychological impact of sound as a powerful source of both communication and bodily experience.

Acoustic mapping methods

Acoustic mapping techniques expand upon the method of proxemics, first widely utilized in archaeological research by Jerry Moore in *Architecture and Power in the Prehispanic Andes* (1996). Proxemics, as initially articulated by Hall (1966), analyzes spatial settings in order to define what kinds of communicative acts – verbal and musical performance, facial expressions, body movements, and so on – are within the capability of human perception in any given space (Inomata and Coben 2006: 30). Architecture creates ordered space that shapes sensory experience. This sensory order conversely defines the types of social relations that participants can engage in within a given spatial arrangement (Inomata and Coben 2006: 17).

The relatively new sub-discipline of archaeoacoustics, the study of past acoustic phenomena, has over the last 15 years produced a number of innovative projects involving the application of acoustic maps to archaeology (Mlekuz 2004; Reznikoff 2006; Waller 2006; Till 2009; Kolar 2012; Mills 2014). Acoustic mapping practices remain as diverse as the questions they attempt to address, with different aspects of analysis requiring bespoke methods, equipment, and modeling software. For example, Steven Waller's (2006) research concerning the correlation of rock art and echo effects at Horseshoe Canyon in Utah created an acoustic map of the canyon by measuring the decibel level of the echo of a sound source at the placement of each rock art panel. In the Andes, researchers at Stanford University have recently completed a computerized acoustic model of the site of Chavín de Huántar, a highland ceremonial center in north-central Peru dating to approximately 3000 years ago (Kolar 2012). The team investigated what role sound might have played in the design of the architecture, especially an elaborate system of tunnels present at the site. To create the models, researchers used high definition recordings of the direct acoustic effects present when musicians played replicas of Chavín period instruments in the tunnels (Kolar 2012). Steve Mills (2014) produced acoustic maps of the mining landscape in West Penwith, Cornwall, in the context of Historic Landscape Characterization, to understand how people would have experienced the sounds of the mines within the surrounding landscape. To create these maps, Mills audio-recorded present-day sounds at a variety of locations over 24-hour periods. In order to ascertain the size of the acoustic communities created by church bells in Slovenia, Dimitrij Mlekuz (2004) generated acoustic maps completely within a geographical information system (GIS) program, without collecting any real-world sound measurements.

Rupert Till's Sounds of Stonehenge Project (2009), which acoustically mapped the site of Stonehenge, provides the basis for the acoustic mapping methods used at Huacas de Moche. The Sounds of Stonehenge project investigators determined that the stone circle reverberated low-frequency tones, such as those produced by drumming, to create overtones similar to those that can induce trance-like states. The positions, spacing and slight curvature of the dressed interior faces of the stones facilitated these effects and contained the sound within the circle, despite the wide gaps between the placement of the stones. The team also discerned that at Stonehenge a strong correlation exists between the spacing of the earthworks surrounding the stone circle and the maximum distance sound travels beyond the circle. Till and his colleagues utilized acoustic measurements taken at the site of Stonehenge and at a life-size replica in the USA to create an accurate digital model using Odeon acoustic modeling software. The acoustic mapping process followed below for Huacas de Moche combines both *in situ* acoustic measurements and GIS software to investigate the levels of inclusivity or exclusivity produced via sound by different types of architecture present at the site.

The data collection process for the production of the acoustic maps of Huacas de Moche employs surface survey techniques utilizing sound-producing and sound-monitoring equipment. This equipment consists of an omni-directional speaker, an amplifier, a hand-held decibel level meter and a GPS. In order to conduct survey in remote areas and also to limit excess sound created by many power sources, a 12-volt car battery and a small power inverter can provide portable power to the speaker and amplifier system in any setting. An omni-directional speaker produces sound equally in all directions simultaneously. When powered, the speaker emits pink noise, a type of sound specifically designed for and utilized by the audio engineering industry to test the acoustic qualities of architecture. Pink noise contains the entire range of frequencies that humans have the ability to hear and produces each octave with equal intensity and power. This configuration most closely mimics the human perception of sound. The standardization of intensity across all octaves creates the conditions under which any change in volume perceived or decibel level change recorded derives solely from environmental factors. The combination of pink noise and the omni-directional speaker controls the variables of direction and intensity, allowing for the specific investigation of the interaction between sound and environment.

Basic survey procedures consist of the following. Researchers choose a location they wish to investigate acoustically and assemble the sound equipment there. The speaker and amplifier system has the capability of emitting sounds above and beyond 130 decibels (dB). The investigation of pre-industrial sound production requires broadcasting a lower sound level, preferably based on either the sounds produced by sonic artifacts contemporary to the culture or time period being studied, or the human voice.[2] For the Moche case study presented here, the team calibrated the sound level emitted by the speaker to register between 95–100 dB in the dBa weight and 100–105 dB in the dBc weight[3] as measured from a meter away from the speaker. Previous work conducted on 439 examples of Moche sonic artifacts from the Museo Rafael Larco Herrera, and el Proyecto Arqueológico Huaca de la Luna, indicate that the highest decibel level any Moche sonic artifact had the capability of producing falls within this decibel range when measured at the distance of one meter from the sound producing end of the instrument (Scullin 2015a). Thus, for the purposes of this study, our team adjusted the speaker to produce the loudest sounds that a Moche sonic artifact could create.

After powering and calibrating the speaker, individuals or teams of surveyors transected the site on foot, stopping every 10 to 20 meters to record a decibel level measurement for both the dBa and dBc weightings. Each individual surveyor or survey team used a hand-held sound level meter, which measures sound levels in decibels, and a GPS. Surveyors registered this information, along with the GPS coordinates of the measurement and various additional observations, on a paper form. This form records the following information: Site Name, Recorder's Name, Date, Speaker Location, Weather, Time, Silent dBa, Silent dBc, Maximum dBa, Maximum dBc, Type of Sound, GPS location, Interior or Exterior of Architecture, Ability to Hear Speaker, Ability to See Speaker, Observations About Visual Field, Observations About Sound and Additional Observations. This paperwork allows for the simultaneous collection of objective decibel level data and subjective experiential observations at spatially fixed points. Anyone can utilize this generic paperwork on any site to record either sound or silent acoustic data.

An individual transect continued away from the speaker until the surveyor could no longer hear the sound, or she reached an insurmountable physical barrier. Once a surveyor finished one path away from the speaker to the edge of hearing, she moved to a different location and recorded points along a different linear path. This process was repeated until surveyors documented the entire area of the site in which individuals could hear the speaker. The team later entered the data recorded on the paperwork into a computer database or spreadsheet program. Utilizing a detailed digital map of the surviving architecture and underlying geography, geographical information systems software interpolated the decibel level data to create an acoustic map (see Figure 11.1). This map not only indicates from which areas of the site a person could hear the sound produced from a particular speaker location, but also tracks the intensity of this sound as it spread out from its source and encountered architecture and natural features.

Mapping arguments

The communication model of mapping, first articulated and widely adhered to in the 1960s and 1970s, asserts that "[m]aps seek to be truth documents; they represent the world as it really is with a known degree of precision" (Kitchin et al. 2009: 4). This idea of maps as truth documents derives from the premise that a world external to human perception does exist, and therefore a map should endeavor to represent this external world as accurately as possible (Kitchin et al. 2009: 5). Within this framework, all innovations in cartographic methods and technologies should seek to increase the accuracy of a map's representation of this real external world. Critical geographers (e.g. Harley 1989; Cosgrove 1999; Crampton 2003; Turnbull 2003; Pickles 2004; Crampton and Krygier 2006; Del Casino Jr. and Hanna 2006; Harris and Harrower 2006; Kitchin and Dodge 2007; Wood and Fels 2008; Harris and Hazen 2009; Kitchin et al. 2009; Krygier and Wood 2009; Perkins 2009; Propen 2009; Perkins 2014) have convincingly argued in recent years that maps do not present the world as it is, or even a world external to human beings. Instead, maps display a world created by humans, experienced by humans and communicated between humans.

Kitchin, Perkins and Dodge in their introduction to *Rethinking Maps: New Frontiers in Cartographic Theory* (2009: 1) write: "[m]apping is epistemological but also deeply ontological – it is both a way of thinking about the world, offering a framework for knowledge, and a set of assertions about the world itself." Creating a map, or even choosing mapping as a method of spatial representation, exposes and reifies the underlying ontology of the mapmaker. The map, as an object, presents a particular perspective on the world, one that perceives the world visually, generally from the air, and possesses the ability to encompass a specified spatial area in totality. To map the world, one must visualize the world in this way, transforming and flattening the physical multi-sensory experience of space to a purely visual one in the mind in order to represent this space on a screen or on paper. Conversely, the map-reader must also possess the ability to conceive of the world in this way in order for the map to function as an object of communication. This need for mutual intelligibility between mapmaker and map-reader has both shaped and been shaped by the human cognitive processes involved in creating and utilizing a map. Walter Ong (1967: 6) elaborates on this idea, stating that "in great part a given culture teaches you how to experience the world, thus it can be useful to think of cultures in terms of the organization of the sensorium." This process of organizing the sensorium occurs through the mutually constitutive relationship between the human body and its surroundings. As Donna Haraway (1997: 132) writes: "[c]artographic practice inherently is learning to make projections that shape worlds in particular ways for various purposes. Each projection produces and implies specific sorts of perspective." A particular style of mapping solidifies a specific way of viewing and ordering the world; the map then affects the way a map-reader thinks about space. This not only leads to the creation of more maps in this style, but it also influences future experiences of and communications about space. The tradition of mapping within which one operates, and the physical process of mapmaking within these ontological constraints, influences the way any mapmaker chooses to collect and present spatial data, exposing in the finished product how a particular culture or group conceives of the world.

Maps not only display the underlying and often subconscious ontology of the mapmaker and map-reader, they also communicate the active choices made by the mapmaker concerning what types of observations to present and how. Since maps are visual representations of the world and not the world itself, maps can only ever display a partial perspective, either due to limitations of scale, of data availability or of types of data represented (Propen 2009: 124). John Pickles asserts in *A History of Spaces* (2004) that maps describe the world only as exposed to our method of questioning. In the case of modern Western mapping traditions, the methods of questioning employed have directly developed from scientific practices. Yet, one can argue that cross-culturally, the primary question determining the methods utilized by any mapmaking project is: how does one transform x (architecture, population numbers, ranges of flora and fauna, topography, or sound) into a visual representation? Data collection subsequently occurs with the final visual transformation and display in mind.

Krygier and Wood (2009: 194) in their visual essay "Ce n'est pas le monde (This is not the world)" describe how, "[m]aps are not views. They show us heavily transformed observations." The types of observations a map presents derive from the motivations behind and the choices employed at every stage in its creation. Following this observation, Harris and Hazen (2009) advocate that the real significance of maps resides in the choices made by the mapmakers. "Rather, it is more useful to think of the relationships that unfold as maps are created, the meanings that are cited in selection of particular technologies or representational techniques by mapmakers, or as maps are engaged by users" (Harris and Hazen 2009: 53). These choices include everything from the basic subject matter to the color scheme of the final product. Consequently, one may analyze maps not only for their content, but how and why they present this content and how the mapmakers chose and collected the necessary data.

Since maps cannot possibly display the external world of human beings as it truly exists, or even how humans actually experience the physical world, maps as simultaneously processes and finished objects not only present data to advance an argument, but as objects, they always act as an argument in and of themselves. Wood and Fels in *The Nature of Maps* (2008: xv), reiterating Harley (1989), write that the map is not a representation, but a system of propositions. They assert that the primary proposition that grants a map its power is the one that states, "this is there," (Wood and Fels 2008: xvi). Maps inherently argue for the presence or absence of things, and presence or absence intimately involves temporality. While all maps only ever depict a specific spatial-temporal moment, maps generally portray primarily durable physical things; things that existed in the particular spatial-temporal context of the map's creation and continue to exist in that location long after. By fixing a temporal moment within a durable material object, the map appears to present an undeniable truth of continuous presence.

This disjunction between the present temporality of the map as an object, and the precise spatial-temporal moment it portrays becomes starkly apparent when attempting to map anything transitory, such as sound. Harris and Hazen (2006: 110) discuss this particular problem in regards to maps of protected wildlife areas. Maps of specific wildlife ranges became the basis for the creation of boundaries for many national parks and other types of nature reserves around the world. Wildlife constantly moves with changing environmental conditions, the fluctuation of which remains impossible to convey with any accuracy on static maps. Since maps present a particular moment as a permanent feature, wildlife often strays from "designated" ranges into unprotected areas. This completely negates the initial purpose of the map as the foundation for the creation of protected spaces for these animal populations. Like wildlife range maps, acoustic maps explicitly expose the temporal fixity of all maps. If one visited the site of Huacas de Moche today and stood in a geographic location that registered loud sound at the time of observation in 2011, one would hear only the sound of wind and wildlife. The loud sound indicated on the map does not presently exist, but the observers did experience it under the specific temporal conditions presented.

Building upon their assertion that all maps argue, "this is there," Wood and Fels (2008: 7) write, "[i]nsisting that something is *there* is a uniquely powerful way of insisting that something *is*." If something *is*, then it can be observed, discussed and marshaled as evidence. By visualizing the auditory, acoustic maps make sound constantly present, constantly *there*, which allows sound to come under the power of the gaze, in the Foucauldian sense, to be contained, subjugated, and analyzed, not purely experienced. The acoustic map explicitly visualizes the invisible and ephemeral phenomena of sound, but maps always make the invisible, or unobservable, visible through the production of scale (Aitken and Craine 2009: 143). By presenting the world at a particular scale, a map allows the viewer to access an area and analyze it in a way they could never have in reality (Harris and Hazen 2009: 60;

Knigge and Cope 2009). Donna Haraway (1991:150) famously called this decorporealized vision 'the god-trick' of seeing everything from nowhere. One could never observe the totality of a continent, or the migration patterns of animals, or the population densities of cities without a map revealing these specific views and fixing them both in time and in space. Unlike the majority of maps, the acoustic map reveals an unseen world in not one, but two ways. First, it visualizes an invisible phenomenon, soundwaves. Second, it presents the perpetuation of sound at a scale no single human being could perceive. Despite its designation as a "sensory map," by transforming sound into image, the acoustic map presents an impossible space that one individual could never directly experience.

This dramatic transformation or translation from sound into image illustrates what Maurice Merleau-Ponty (1981) describes as the process of creating knowledge. The core principle of Merleau-Ponty's phenomenology is that human beings experience the world with our entire bodies synaesthetically, or with all our senses simultaneously. He explicitly writes how the conceptual separation of the senses is an artificial, or cultural separation, not a separation inherent or intrinsic to the human body (Merleau-Ponty 1981: 229). Merleau-Ponty (1981: 229) further argues that while synaesthetic perception is the rule, the senses remain distinct from each other in so far as each one of them brings with it a structure of being which can never be exactly transposed by another. Instead, the senses intimately communicate with each other, translating each other without any need of an interpreter (Merleau-Ponty 1981: 235). Despite these assertions, Merleau-Ponty (1981:238) muses that in order to analyze, in a scientific manner, an object, emotion or experience, one must break up this holistic perception into separate qualities and sensations and then re-synthesize them to form understanding and knowledge. The artificial separation of the senses for analysis has created the category of the "objective," versus the more holistic "subjective" observation category.

The creation of an acoustic map explicitly demonstrates this process of separation, analysis and re-synthesization. An acoustic map of an archaeological space attempts to isolate sound as a distinct variable of experience. It visualizes the acoustic space created by the interaction of a particular sound and environment. This visualization allows for the analysis of the interaction between sound and space with the goal of quantifying what types of experiences each space affords. Using these quantifications, one can compare different types of spaces sonically. In the same way that archaeology has attempted to standardize descriptions of color and texture, sound already possesses a scientific vocabulary of measurement in the form of decibels for volume and frequencies for pitch. Decibel levels fall into the objective category, immediately reducing the emotional efficacy of sound to a nearly unintelligible number designating its volume. One can easily statistically analyze these numbers in multiple ways, whereas emotional and, hence, subjective observations such as soft, loud, appealing, annoying, musical or noisy, appear more difficult to compare with any perceived accuracy. Therefore, in order to achieve objectivity, archaeological data collection must approach sound as a separate, quantifiable entity.

Thus far, I have discussed the map as a product of choices made by humans, including what data to map, how to collect this data and then how to present it. If the map never displays the "real" world, what does mapping accomplish and how does it continue to maintain its relevance and even supremacy, especially within archaeology? Without exploring the semiological significance of maps (see Goodchild 2009; MacEachren 1995; Staat 1993; Schlichtmann 1999), the persistent power and allure of mapmaking lies in the map's ability to appear objective and to act as a "truth document." It achieves this through its durability as a physical object. Christopher Witmore (2013: 128) deconstructs the work maps do and what mapping achieves in his essay *The World on a Flat Surface*, asserting that, "[a] map allows someone to represent a place, to transfer it to somewhere else while maintaining something of its reality in two dimensions." He emphasizes how the portability of maps, as a mimetic representation of place, affords the movement and transfer of place through space. Bruno Latour (1986) refers to objects with this ability as "immutable mobiles." The content of primarily visual objects, such as text, drawings, or photographs does not intrinsically change in relation to their spatial location. At this stage in his career, Latour (1986) credited the power wielded by inscription and image to their status as immutable mobiles. Kitchin and Dodge (2007: 340) (and later Kitchin et al. 2013) contest the immutability of maps, instead claiming that "[m]aps have no ontological security, they are of-the-moment; transitory, fleeting, contingent, relational and context-dependent. They are never fully formed and their work is never complete." They argue that maps are continually emergent, only coming into being via relations and interactions with others (Kitchin and Dodge 2007: 342). Recently, Kitchin et al. (2013: 482) adopt a more actor-network approach to mapping,[4] stating how "mappings unfold in the entangled meshwork (conditions of possibility among the relations between actants) of their creation, use and unfolding of everyday life and space." While this approach reframes the debate from what maps do to how maps enact relationships, claiming that maps are entirely mutable denies a map's ability to enter into relationships as a definable actant. Chris Perkins (2014: 305) instead argues for maps possessing both mutable and immutable aspects, stating how "[m]aps have an agency, but interpretation flows from actions and tasks that take place in particular contexts." He writes how a mapping system "appears at once fixed and changeable," (Perkins (2014: 309), especially in the age of digital mapping. Yet, all maps, both physical and digital have these qualities, as any individual could amend a physical map for their personal use, but these changes would not necessarily effect further reproduction and dissemination.

A number of critical geographers (Crampton 2003; Elwood 2009; Pavlovskaya 2009) claim that a map's truthful authority derives from its visual presentation. For example, Marianna Pavlovskaya (2009: 23) states how new technology such as GIS "unveils worlds to researchers, policy makers and the public, worlds made 'true' by the assumed legitimacy of data and visual displays." Kitchin et al. (2009: 8) write "mapping is still about revealing truth through a scientific approach reliant upon Western ways of seeing and upon technologies of vision; it still depends upon scientific experimentation and a representational view of the world." Certainly the position maps have achieved within archaeology, as analytical tools and objects of preservation, stems from the reliance on and importance of visual recording methods to the discipline. Sheila Bonde and Stephen Houston (2013) iterate how visualization lies at the heart of most of archaeological practice, as archaeologists primarily employ entirely visual methods such as drawing, mapping, writing, or photographing to record archaeological sites and materials. This faith in data visualization allows the map to generate scientific knowledge and, thus, become useable for archaeological research.

One can argue that maps gain their power from the combination of their mutable visual presentation of information, which remains perpetually emergent and open to interpretation, and their immutable nature as a durable, material object. Early within the critical geography movement, John Pickles (1991: 403) alerted readers to the power of maps deriving in part from their external reality, stating "[a]lthough the map is an embedded figure, the map is also an object that has a structural autonomy independent of both its production and its use." Due to its external materiality as a separate durable object within the world, one can consult with a map and have it agree or disagree. It actively argues through its physical presence, and this capacity to argue grants it authority. Even though maps today exist primarily digitally and projected onto screens, they continue to have the ability to fix time and to transform the ephemeral into something durable. This durability allows the map to act as primary evidence, the legitimacy of which one cannot dispute, unlike more subjective types of data. The map simultaneously acts as an argument of legitimacy and provides evidence in support of other arguments. Thus if one accepts the underlying argument presented by a map, *this is there*, the materiality of the map as an object we experience with our senses, either visually or tactically, asserts that the map must be *true*.

Wood and Fels (2008), citing Shapin and Schiffer's *Leviathan and the Air-Pump* (1985), attribute the power of maps to their alignment with scientific methods and objectivity. Shapin and Schiffer (1985) convincingly argue that the power granted to science as a form of knowledge production originates from the acknowledgement that human perceptions are biased and flawed. Only non-human instruments can provide unbiased testimony and create real, truthful data. One can agree or disagree with any interpretations or arguments that marshal said data as evidence, but the non-human observations, the data itself, cannot be disputed as it is supposedly beyond the realm of human influence.[5] Daston and Galison (2007: 369), discussing this mechanical turn in scientific practices in *Objectivity*, state that "[o] nce internalized by a scientific collective, these various ways of seeing were lodged deeper than evidence; they defined what evidence was." Just as laboratory equipment hides the motivations and biases of the people who build and use it, the map's autonomy as an object obscures its human authors, and presents information as an independent and objective source. The map acts as a non-human object that provides testimony via visual representation.

The foundational premise behind the scientific method is that the world exists external to human perception. As previously discussed, maps never present this world. Instead, maps actively create the world (Haraway 1997; Kitchin et al. 2013). Yet, Kitchin et al. (2009: 15) emphasize how "[w]hat is mapped, how it is mapped, and the power of maps is the result of Western science's ability to set the parameters and to dominate the debate about legitimate forms of knowledge." Bonde and Houston (2013: 3–14), making an explicitly archaeological argument concerning the apparent divide between objective and subjective data, write how "[u]ltimately, most of us affirm that what is said or depicted should derive from reasoned evidence and argument and that, if rightly presented, these two elements reveal more about the past than was known before as conditioned by the questions to which representations respond." This is the legacy of processual archaeology; the only evidence allowed in serious archaeological arguments must derive from some type of data produced by a scientific method and displayed visually. The impetus to acoustically map archaeological sites developed not only from a larger Western mapmaking tradition, but also from the continued importance within archaeological practice to document data visually and to disseminate data using primarily visual media (Mlekuz 2004; Scarre and Lawson 2006; Till 2009; Kolar 2012; Mills 2014). Presenting sound data at conferences or via printed publications, such as this one, necessitates its transformation into some type of visual representation.

The acoustic map does not represent an external reality. It not only reflects the ontology of the mapmaker, the academic discipline within which she operates and the choices she has made during the data collection process, but portrays a fleeting spatial-temporal moment. Its production derives from the larger Western mapmaking tradition rooted in the scientific method and the techniques employed by archaeology. Making the invisible and ephemeral durable and visible, the acoustic map argues for the presence of sound as an important aspect of spatial design and experience. The physicality of the acoustic map as a durable object affords the presentation of the normally considered subjective observations of bodily experience as objective data with the ability to undergo analysis and act as acceptable evidence for archaeological interpretation.

Mapping experience: acoustic maps of Huacas de Moche

The following section presents a case study of the experience of sound at the Moche urban site of Huacas de Moche. It describes the types of data that acoustic maps produce and how one can utilize this data to create specific interpretations concerning the experience of sound in past contexts. The terms *Moche* or *Mochicas* refer to a collection of complex polities that occupied the north coast of Peru from approximately AD 100–850. (Figure 11.2.) At its height, the Moche cultural influence extended over 250 km from the Piura valley in the north to the Nepeña valley in the south. This area consists almost entirely of dry coastal desert that receives almost no annual rainfall. Rivers of varying sizes and pathways cut across this desert from their sources in the Andes and flow west to the Pacific Ocean, creating fertile valleys that concentrate populations (Bawden 1999). The Moche territory contains at least two distinct polities, both considered as part of the wider Moche culture, but possessing differing political strategies and material practices (Castillo and Donnan 1994). The Northern Moche Area consists of all the valleys north of the desert region known as the Pampa de Paiján, ranging from the Jequetepeque to the Piura. The Southern Moche Area includes all

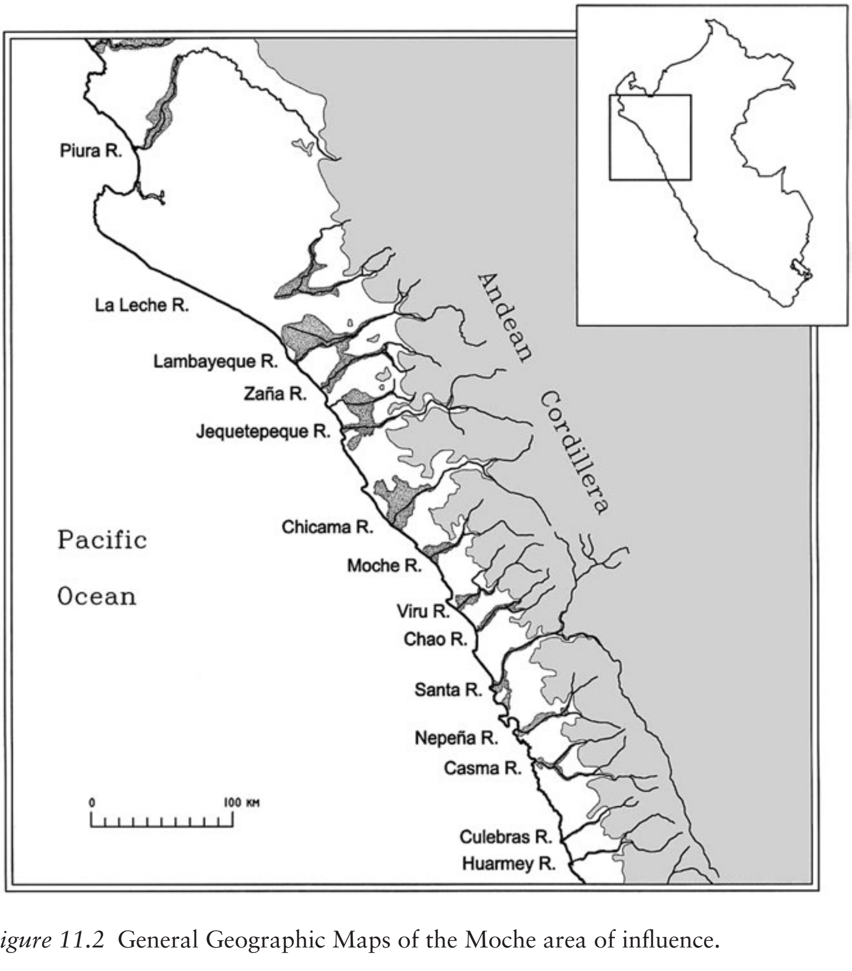

Piura R.
La Leche R.
Lambayeque R.
Zaña R.
Jequetepeque R.
Chicama R.
Moche R.
Viru R.
Chao R.
Santa R.
Nepeña R.
Casma R.
Culebras R.
Huarmey R.
Pacific
Ocean
Andean
Cordillera
0
100 KM

Figure 11.2 General Geographic Maps of the Moche area of influence.

of the valleys to the south of this feature, from the Chicama to the Nepeña. Recent research has revealed major political and material culture differences beyond this north/south divide, calling into question the long-held assumption that the Moche represent a cohesive early state-level society (Castillo and Quilter 2010; Quilter and Koons 2012). Yet many scholars continue to argue that the Moche represent a discrete "theocratic state", possessing hierarchical religious and political organizations, urbanization, and craft specialization, the dynamics of which are expressed differently in each valley within the wider area of Moche cultural influence outlined above (Bourget 2010; Canziani 2010; Donnan 2010; Uceda 2010).

The large Moche urban center of Huacas de Moche sits at the foot of a lone mountain, Cerro Blanco, on the south bank of the Moche River, about 5 kilometers from the coast (Uceda and Armas 1998). It consists primarily of two adobe pyramids, Huaca del Sol and Huaca de la Luna, situated 500 meters apart (Uceda and Armas 1998). Between these adobe pyramids lies a wide flat plain containing residential and craft production architecture, referred to as the Urban Zone (Uceda and Mujica 2004: 15). Occupation at Huacas de Moche spans the entire Moche sequence (AD 100–850) and beyond, but reached its height of power and influence during the Moche III and Moche IV time periods, between AD 350 and AD 650 (Uceda 2005: 8). The reconstructed occupational sequence of the Huacas de Moche site is based on detailed stratigraphic studies and long sequences of radiometric dates (Uceda 2010: 133). These dates correspond to the progression of the Larco (2001) ceramic stylistic sequence as follows: Moche I (AD 100–200), Moche II (AD 200–350), Moche III (AD 350–500), and Moche IV (AD 500–850) (Uceda 2005: 8).

Two primary locations underwent acoustic survey at Huacas de Moche: the main open platform space at the north end of Huaca del Sol and Plaza 1 at Huaca de la Luna. These are the most likely settings for the large performances involving sound depicted in Moche iconography (see Scullin 2015b). Speaker placements at these two locations also tested the following hypotheses: first, that the Huacas could "speak" to one another, i.e., could communicate audibly, and second, that the open plaza of Huaca del Sol would create a larger, more inclusive acoustic space than the enclosed plaza of Huaca de la Luna. The creation of separate dBa and dBc maps for each speaker location differentiated any specific changes between the perception and spatial distribution of high and low frequency sounds produced by various Moche sonic artifacts.[6]

Huaca del Sol

Our team assembled the speaker in the middle of what remains of the northern platform area of Huaca del Sol. Looting activity carried out in the early colonial period has destroyed at least two-thirds of the monument, but when complete, Huaca del Sol was the largest adobe structure in the Americas (Hastings and Moseley 1975: 196). Built in the shape of a cross, Huaca del Sol measured at least 340 meters long by more than 160 meters wide (Hastings and Moseley 1975: 196). Grander in scale but less architecturally complex than Huaca de la Luna, Huaca del Sol has one major open platform located on its northern end. This platform, when complete, measured approximately 150 meters wide, 80 meters long and 28 meters high. Based on these measurements, it is estimated that this space could accommodate between 6,000 and 12,000 people. People standing on top of the northern platform at Huaca del Sol are visible across the entire Huacas de Moche site. The final construction and expansion of Huaca del Sol coincides with the abandonment of the main Huaca de la Luna platform complex and the construction of the smaller "new temple" to the east of Huaca de la Luna (Uceda 2010). This corresponds with a severe ENSO (El Niño/Southern Oscillation) event that occurred sometime between AD 550 and 600, and marked the transition between the Moche III and Moche IV time periods. If Moche elites utilized the northern platform of Huaca del Sol for public performances, this large raised platform created a distinctly different spatial arrangement and aural experience than the enclosed and ground level Plaza 1 space at Huaca de la Luna.

A comparison of the high- and low-frequency maps generated for the Huaca del Sol northern platform (Figures 11.3 and 11.4) reveals drastic differences between the distances and areas covered by these two different types of sounds. High frequencies dissipate rapidly from this location, being barely audible halfway across the Urban Zone. High frequency sound also does not reach any part of the Huaca de la Luna complex. In contrast, low-frequency sounds are strongly audible across most of the site, consistently registering decibel levels of between 60 and 70 across the Urban Zone.[7] One can hear low-frequency sound from the western side of the Huaca de la Luna complex, but very softly, between only 40 and 50 decibels. Figure 11.5 illustrates the average decibel levels for a variety of modern musical instruments and sonic experiences for comparison.

Huaca de la Luna Plaza 1

Huaca de la Luna, the smaller of the two adobe pyramids, includes three large platforms situated on different levels, linked by adjacent plazas of varying sizes. Plaza 1, the large main plaza, measures approximately 170 meters long by 75 meters wide, encompassing a space of 12,750 square meters. This space has the potential to accommodate between 6,000 and 12,500 people. A wall, nearly 3 meters high in some places, encloses Plaza 1 and only has two small entrances: one on the northern side and another near the western corner. The entrance located in the center of the north end of the plaza is baffled by adobe walls, which form a short east/west corridor. The second entrance, recently excavated in 2012,[8] is located towards the southern end

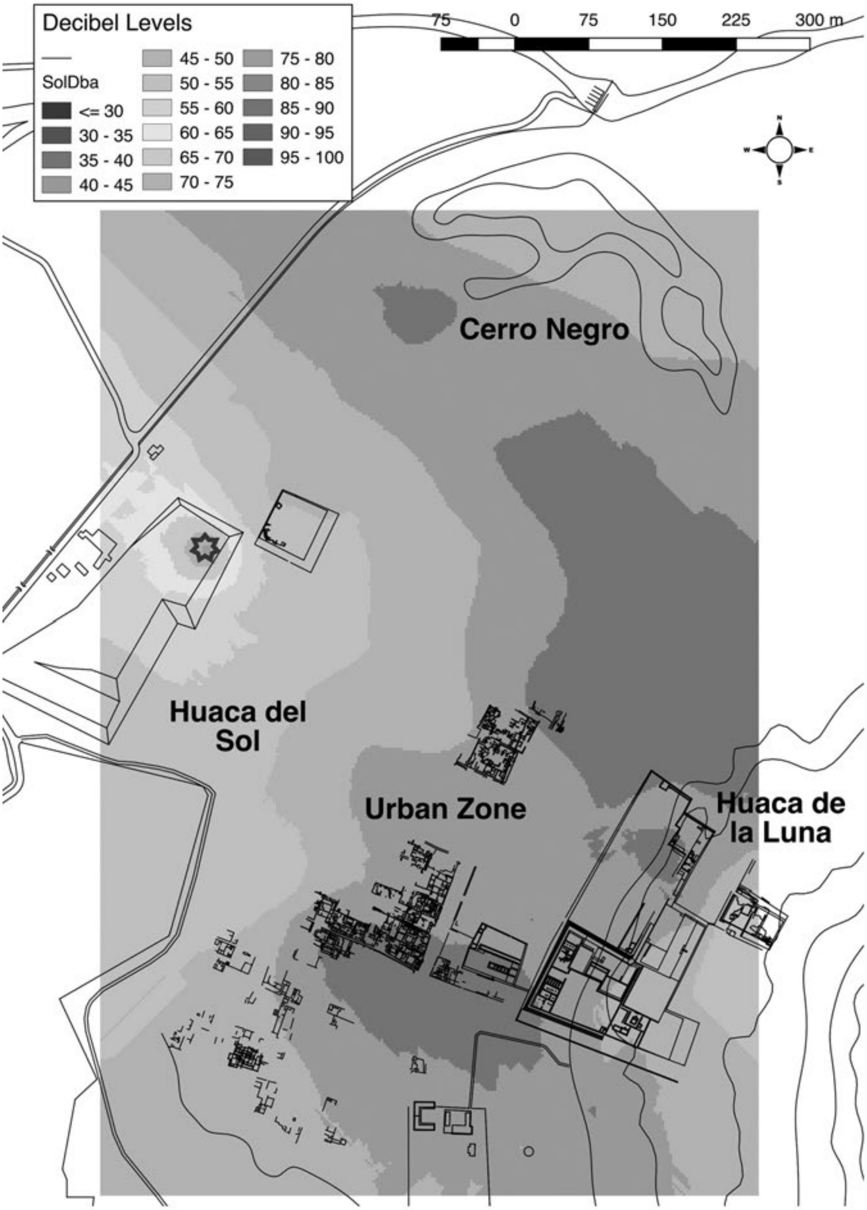

Decibel Levels
SolDba
<= 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
85 - 90
90 - 95
95 - 100
75
0
75
150
225
300 m
N
W
E
S
Cerro Negro
Huaca del Sol
Urban Zone
Huaca de la Luna

Figure 11.3 Huaca del Sol high-frequency map. The star represents the speaker location.

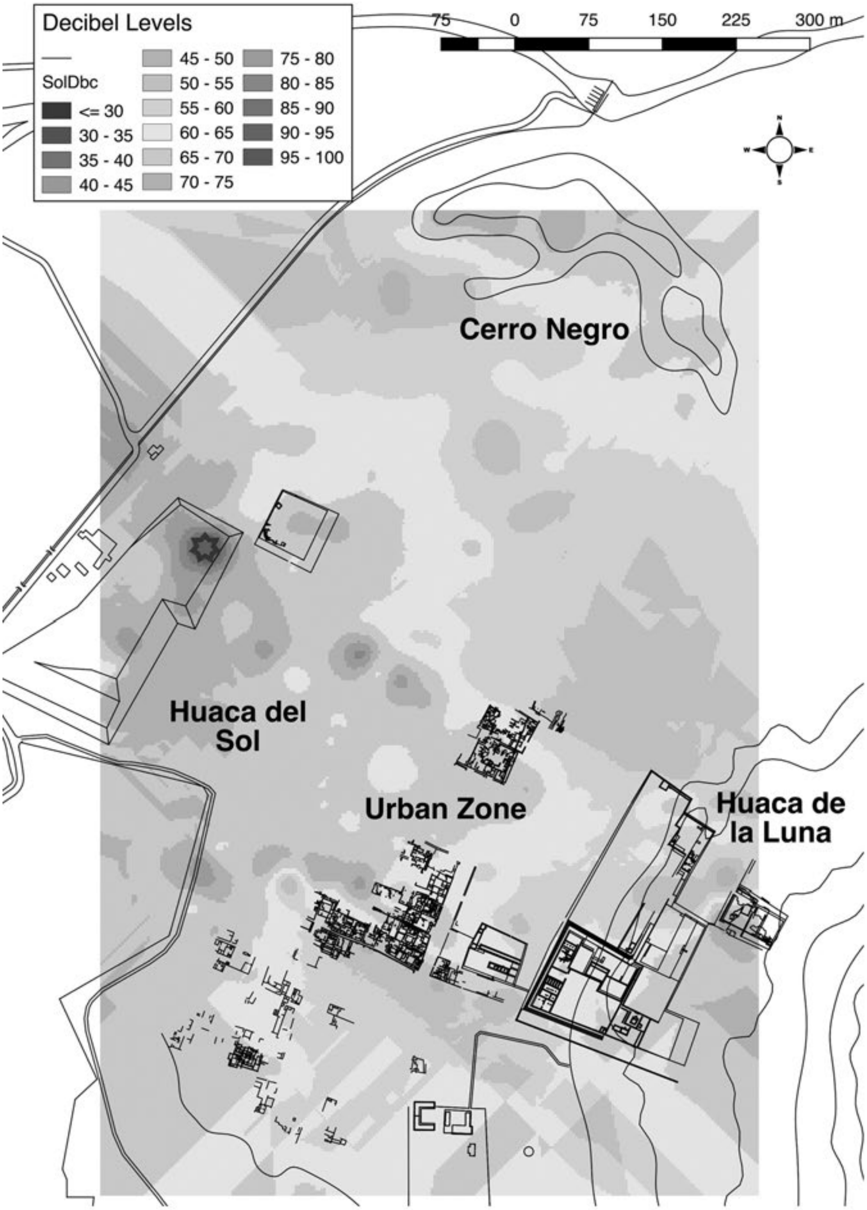

Decibel Levels
SolDbc
<= 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
85 - 90
90 - 95
95 - 100
75
0
75
150
225
300 m
N
W
E
S
Cerro Negro
Huaca del Sol
Urban Zone
Huaca de la Luna

Figure 11.4 Huaca del Sol low-frequency map. The star represents the speaker location.

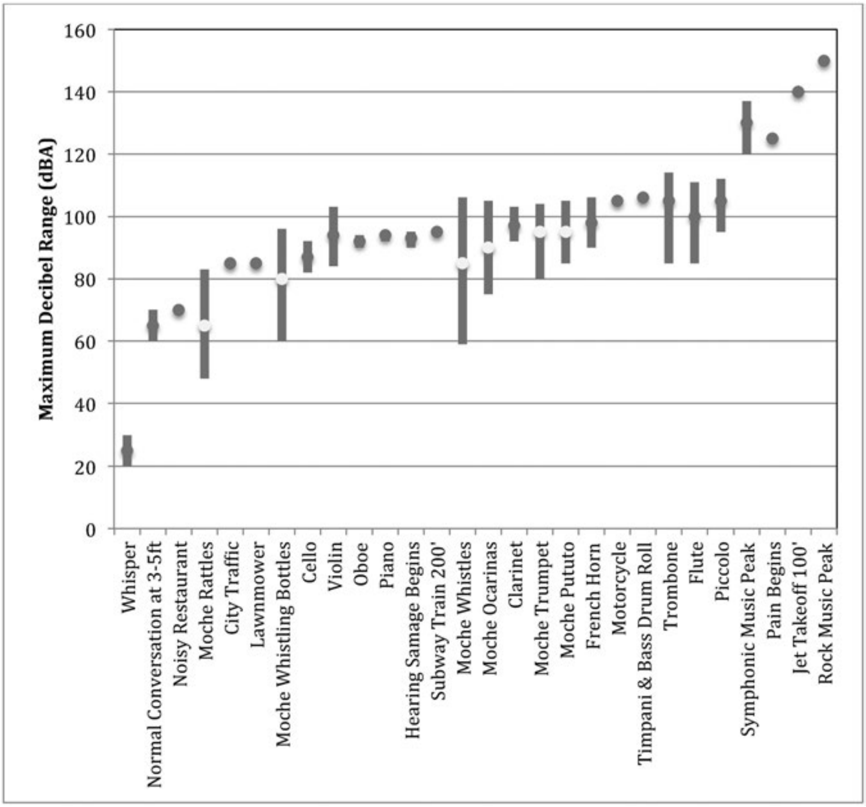


Figure 11.5 Maximum decibel level ranges of modern and Moche instrumentation.

of the western wall of Plaza 1. This entrance connects one of the main east/west avenues through the Urban Zone with Plaza 1.

The south façade of Plaza 1 consists of multiple tiered steps, culminating in a small ritual platform (Platform 1) at the top, 32 meters above the floor of Plaza 1. This ritual platform remains visible from Plaza 1, allowing the people gathered below to observe any ceremonies taking place on this platform (Uceda 2010: 151). Each tier on the south façade displays – in a scale larger than life – polychrome low-relief sculptures of various figures and images (Figure 11.6). The bottom tier portrays warriors leading nude prisoners; the tier above presents dancers holding hands, and the upper tiers display zoomorphic deities (Uceda 2010: 151). A large ramp begins about halfway along the eastern wall of the plaza. This ramp extends 60m from the floor of the plaza to the top tier of the southern façade and leads to Platform 1. The exterior of this ramp depicts a large eared serpent in adobe low relief sculpture.

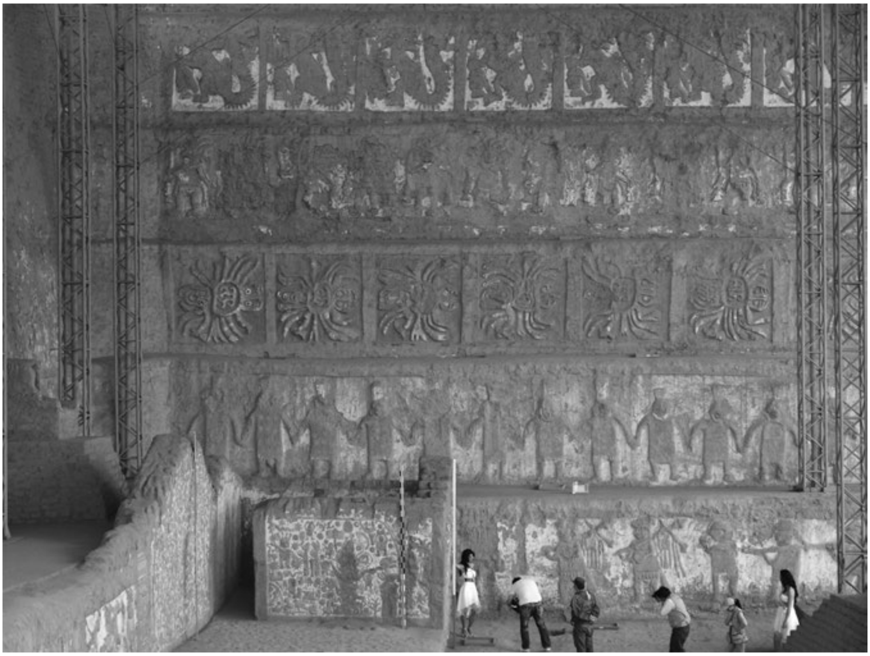


Figure 11.6 Huaca de la Luna Plaza 1 south façade.

The tall encircling adobe wall does not permit anyone outside of Plaza 1 to view events taking place within the plaza. Yet people outside Plaza 1 could see the top of the ramp and any activities taking place on Platform 1 of Huaca de la Luna. The baffled entrance at the northern end of the plaza further emphasizes the visual exclusivity of the Plaza 1 space, since when entering through this opening one could not directly observe the interior of the plaza. Visually, Plaza 1 and the Huaca de la Luna summit platform create differential access to performances, with the activities taking place on the top of the Huaca more visually accessible to the residents of the Urban Zone than those taking place within the plaza itself.

Analysis of the acoustic maps from Huaca de la Luna (Figures 11.1 and 11.7) reveal that the Plaza 1 space, to a large extent, contains high-frequency sound within its enclosed area. The intensity of the high frequencies does not vary greatly across the interior plaza, maintaining levels between 60 and 70 decibels throughout the space. High-frequency sound does extend outward from Plaza 1 in a distinct east-to-west band across the Urban Zone. This band of sound fluctuates across the site between the decibel levels of 50 and 70. When high-frequency sound reaches the north platform of Huaca del Sol, its volume diminishes to barely audible. Low-frequency sounds emanating from Plaza 1 follow a similar distribution pattern, but with different decibel

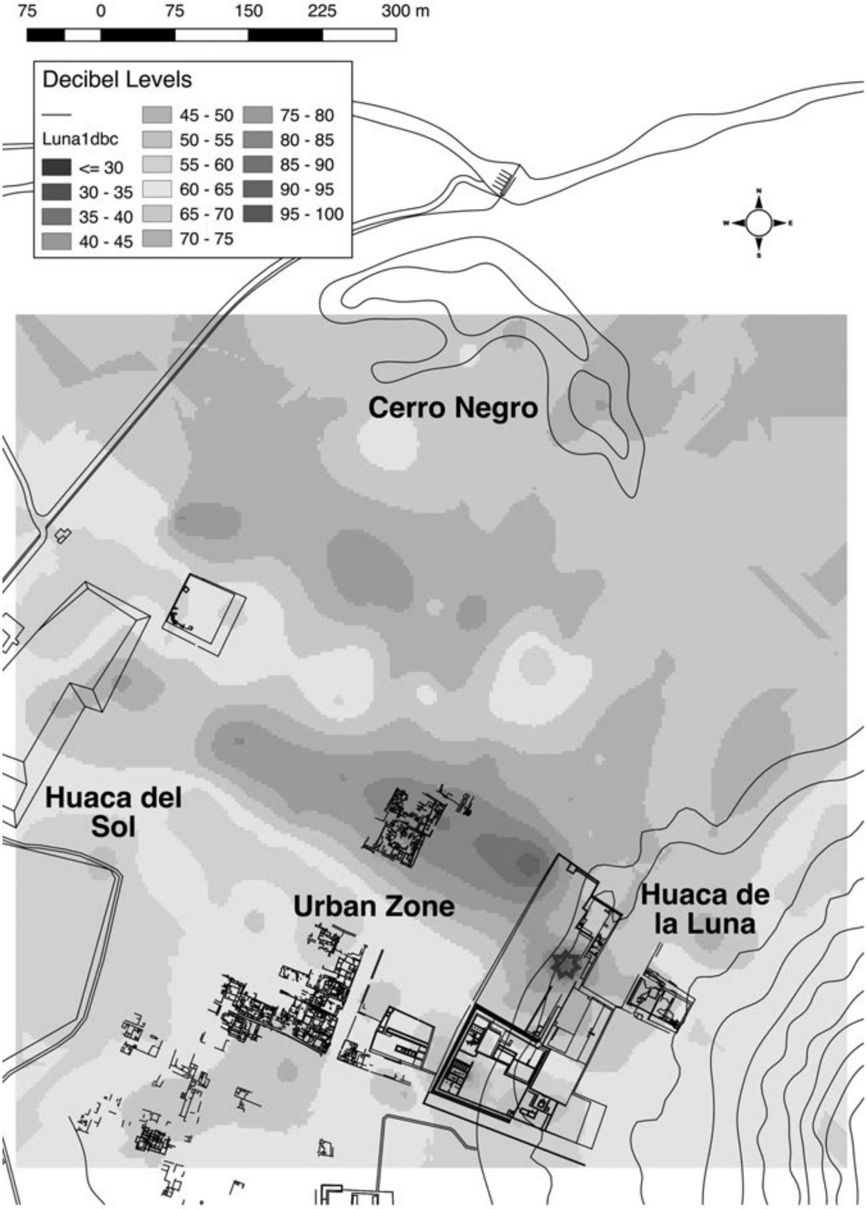

75
0
75
150
225
300 m
Decibel Levels
Luna1dbc
<= 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
85 - 90
90 - 95
95 - 100
N
W
E
S
Cerro Negro
Huaca del Sol
Urban Zone
Huaca de la Luna

Figure 11.7 Huaca de la Luna low-frequency map. The star represents the speaker location.

intensity. Low-frequency sound envelops the interior of Plaza 1 at a lower volume of only 75 decibels. In contrast to the high-frequency sound, low-frequency sound blankets the entire Huacas de Moche site at between 60 and 75 decibels, including the north platform of Huaca del Sol. The low-frequency volume extends in the same east-to-west band across the Urban Zone as the high frequencies, but at between 80 and 90 decibels, louder than within most of the plaza itself.

Interestingly, the main platform complex of Huaca de la Luna remains relatively sonically isolated from Plaza 1. Platform 1 at Huaca de la Luna, despite being located directly adjacent to Plaza 1, only registered a maximum volume of 55 decibels in the low frequencies and 45 in the high frequencies, both measurements softer than a normal human speaking voice. This measurement was made despite the partial roof, which should have funneled the sound towards the top of the Huaca, making the sound even louder than perhaps it had been in the past. This change in sensory experience from the floor of Plaza 1 to Platform 1 of Huaca de la Luna perhaps further differentiated these spaces from one another and emphasized their different roles.

Discussion

Low-frequency sounds, such as drumming, would have travelled the distance between both Huaca de la Luna and Huaca del Sol, but high frequencies did not reach Huaca de la Luna from Huaca del Sol and barely reached Sol from Luna. Therefore, Huaca de la Luna can “speak” to Huaca del Sol more easily than Huaca del Sol can “speak” to Huaca de la Luna. The Urban Zone area between the Huacas corresponds almost directly to the limited distance sound can travel from either structure. High-frequency sound, such as those produced by whistles and ocarinas, was generally contained within Plaza 1 of Huaca de la Luna, except in select areas of the Urban Zone. In contrast, low-frequency sound, such as produced by drums and trumpets, permeated the entire site. The acoustic data from both Huaca del Sol and Huaca de la Luna demonstrate that not only were the inhabitants of the urban zone in constant visual contact with these Huaca structures, but they maintained continuous aural contact with most of the sounds emanating from them. Population estimates for Huacas de Moche range from 15,000 to 25,000 inhabitants (Toyne et al. 2014). Neither Plaza 1 nor the north platform of Huaca del Sol could accommodate the entire population, but the entire population could hear performances taking place at Huaca de la Luna or see them from Huaca del Sol. The totality of the Urban Zone can be considered a passive acoustic community created and bounded by the two Huacas.

The analysis of the acoustic maps demonstrates that while the wall surrounding Plaza 1 obscured the visual spectacle occurring within, it did a poor job of containing sound. In fact, more sound permeated the urban zone than reached the inner sanctum of the Huaca itself. This pattern creates different levels of participation, between those inside and those outside the plaza. It also broadcasts the presence of a performance to the entire Huacas de Moche settlement, making the whole population constantly aware of these elite-sponsored performances taking place within Plaza 1, and emphasizing the link between sound and performance. Huaca de la Luna creates a complex differentiation not only of space, but also of sensory access to performance. It visually obscures activities taking place within Plaza 1, but amplifies the sound of this activity. This situation allows for a passive acknowledgment of the presence of performances by the residents of the Urban Zone. The Huaca de la Luna architecture also permits a greater visual engagement with specific performance elements, such as sacrifice, conducted on the top platform of the Huaca.

In contrast to Huaca de la Luna, the northern platform at Huaca del Sol affords a highly visual spectacle, but a poor auditory one. Sonic performance at Huaca del Sol had a very diminished range compared to those in the Plaza 1 of Huaca de la Luna. High-frequency sounds produced at Huaca del Sol barely extended 250 meters beyond the structure. Low-frequency sounds did permeate the site and reached the western side of Huaca de la Luna, but very softly, in places almost inaudible. Huaca del Sol, in contrast to Huaca de la Luna, creates a sensory experience where a large audience could see the activities taking place on the platform, but only those within or directly adjacent to the complex could hear them. Urban Zone residents would have had to actively engage with performances taking place at Huaca del Sol, as opposed to passively acknowledging their presence, as with performances at Huaca de la Luna. The abandonment of Huaca de la Luna and the enlargement of Huaca del Sol correspond with the Late Moche (AD500–850) shift towards a proliferation of smaller-scale performances taking place in the residential plazas in the Urban Zone. The Plaza 1 space at Huaca de la Luna presents a singular message of sonic presence, which could have created a single large acoustic community that included the entire site population. Huaca del Sol, despite its visual grandeur, required greater levels of active participation in sonic performance events.

Arguing with maps

The acoustic maps of Huacas de Moche provide evidence in support of two primary arguments. First, that the experience of sound, or at least the physical limits of sound transmission, may have affected the design and construction of the two huacas. Second, that the experience of sound created differential access to aspects of Moche performances carried out in these spaces. In this manner, acoustic maps supply data in support of specific archaeological interpretations, but as previously discussed, a map presents an argument via its existence as an object. When analyzed from the perspective of how the acoustic map displays its content and why, it becomes apparent that the acoustic map intends to legitimate the study of sound within archaeological discourse by working within already existing mapping practices. The acoustic map argues for the presence of sound as an inherent and important aspect of space, presenting a specific claim concerning the way human beings may have experienced sound in the particular space displayed. Like almost all archaeological maps, an acoustic map depicts an archaeological site as viewed from the air in its totality. This includes architectural features either excavated previously or currently visible and the topography of the underlying landmass. Its representation of the site remains devoid of people, material culture, flora and fauna. Black and white lines function to delineate architecture and topography, intended to provide the background on which the more important data will overlay. The map does not depict architecture in the crumbling ruined state in which it presently exists, but as perfect geometry, how the architecture "must have been" when first constructed. The presentation of the site in its pristine, "original" state persists despite the collection of all sonic observations occurring within the present "ruined" archaeological site.

A projection of the extent and intensity of sound when broadcast from a particular place superimposes this base map. The amorphous boundaries of the acoustic data create a stark contrast to the orderly black and white lines of the architectural map, attempting to convey some of the frenetic energy experienced as sound disperses. This presentation of the acoustic data forces the viewer to attempt to visualize sound as waves emanating from a source like the waves of the ocean reaching the shore or ripples from a disturbance on the surface of a lake. The overhead view provides a static picture of how far the sound travels and the volume level it maintains. It displays to the viewer the entire area the sound covers, and by extension, the full impact sound exerts, even across the vast spaces portrayed. The lack of conformity to the black and white architectural boundaries illustrates how walls do not present strict barriers to sound, as sound finds a way around, over, under and through them. In many cases, the acoustic map reveals that architecture presents no boundary to sound at all, only a boundary for human movement and the human eyes. In a similar manner as a sudden loud sound startling a listener and making one involuntarily turn one's head toward the source, the coverage and disorderly shapes employed by the acoustic map attempt to shock the viewer, to force one to take notice that sound does not represent a trivial phenomena, but one with a potentially large impact.

Beyond acting as evidence for archaeological interpretations, the main obligation of any archaeological map is to provide a lasting record of past contexts, as archaeology is inherently destructive. In this function, archaeologists continue to perceive the map as an objective "truth document" that accurately preserves contexts destroyed by excavation techniques for future analysis and interpretation. Christopher Witmore (2013: 130) writes, "[t]he qualities of archaeological maps allow them to be built upon, thus forming a kind of media cascade as subsequent maps are compiled out of former ones." The further down the cascade, the more ossified as truth these maps become. This premise inherently questions the legitimacy of an acoustic map, which at first viewing appears to overlay a wholly fabricated experiential layer on the more permanent and therefore “real” base maps of architecture and geography. Utilizing a map as part of an archaeological argument, most archaeologists equate durability with objectivity; a false assumption. All archaeological maps only depict a particular temporal moment, that of the open excavation. While the contexts recorded may be left exposed in perpetuity, more than likely excavators either re-bury them for preservation purposes, or remove them in order to uncover earlier occupations. Since maps cannot convey the totality of any archaeological context, many categories of things remain absent on finished plan-views. Instead, any archaeological map only displays aspects of any context deemed important by the archaeologist at the time of excavation, which may include combinations of architectural features, artifact placements, soil stains, topography, animal disturbance or any number of visually presented categories. Rather than accurately preserving archaeological contexts, maps record the motivations, research frameworks, training and underlying ontologies of the archaeologist who authors them. By foregrounding sound, the acoustic map of an archaeological site argues that archaeologists should consider sound as an equally important aspect of any past context.

Isolating sound and transforming its ephemeral presence into a durable visual representation has many advantages and disadvantages. Sound always signals the present use of power and sound remains inseperable from action (Ong 1967: 112). The acoustic mapping process involves experiencing this movement and sound energy, but actively and continuously translating that experience into numbers and words; capturing that experience in a more permanent form, that of writing and image. For example, the first iteration of the acoustic map can be seen in Figure 11.8, the dots representing individual decibel readings taken along transects. This map intrinsically visualizes movement, however erratic, of the individual surveyor, or human body across the landscape. Jeremy Crampton (2003: 3) writes “[m]aps provide a spatialized understanding of the world,” but this spatialized understanding is omnidirectional and omniscient. The map has boundaries and borders, but it does not have a specific starting place, or a *source*. The way human beings experience sound is in the surround, with the human body as the center. While we can easily locate the direction and intensity of different sound sources, sound comes at us omni-directionally. As Salomé Voeglin (2014: 10) explains: “[l]istening, we are continually made aware of this fleeting subjectivity, and we are reminded also that the world is not only in front of us, the aim of our action, but that we inhabit it as a 360 degree environment, which sounds the result and consequence of our actions too.” The acoustic map attempts to bring this three-dimensional aspect of sound to the two-dimensional plain. Even though it depicts the range of a specific sound source, it does not require the readers of the map to insert themselves into any particular area, capturing the omni-directional and omni-present nature of the sound when one experiences it in the environment depicted.

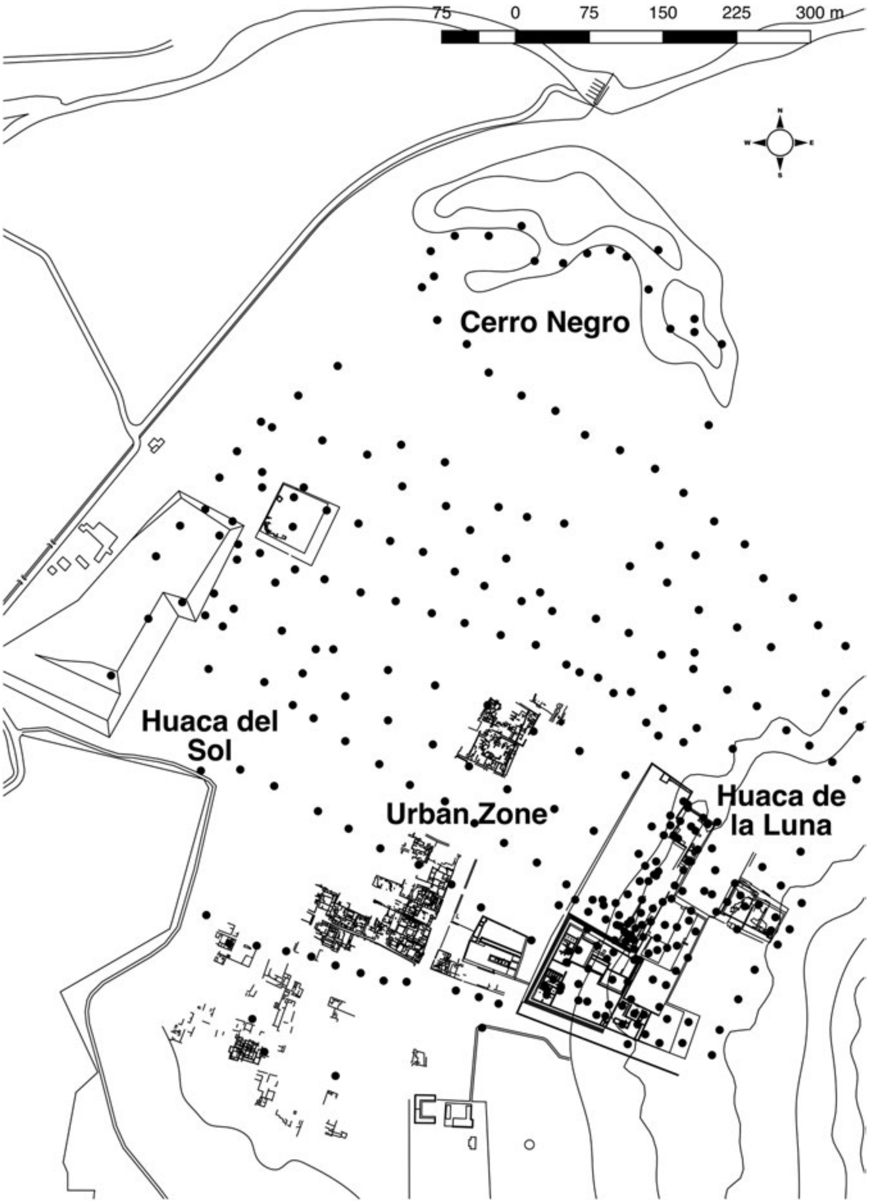

75
0
75
150
225
300 m
N
W
E
S
Cerro Negro
Huaca del Sol
Urban Zone
Huaca de la Luna

Figure 11.8 Huaca de la Luna initial transect locations.

Alan MacEachren and Menno-Jan Kraak (1997: 339) in their essay *Exploratory Cartographic Visualization: Advancing the Agenda* write how, "[v]isualization applied to analysis generally involves manipulation of known data in a search for unknown relationships and answers to questions." Dodge, Kitchin and Perkins, in their introduction to *The Map Reader* (2011: xix) later echo this assertion, arguing that "[m]apping provides a uniquely powerful visual means to classify, represent and communicate information about places that are too large and too complex to be seen directly." These authors refer to un-seeable phenomena that exist beyond the scale of an individual human, such as vast distances, large populations or deep timespans. Through the production of different scales, maps have the ability to reveal relationships and phenomena that affect human life beyond individual experience. The acoustic map extends this ability. Instead of taking visible component parts and forming a whole that was invisible prior to the creation of a map, the acoustic map directly visualizes the invisible waves of sound as they move about an area. Mapping invisible phenomena, such as sound, make them visible and therefore real and significant, worthy of analysis and interpretation (Pavlovskaya 2009: 28). The creation of this durable, objective image in the acoustic map also opens up an entirely different area of inquiry and knowledge production. The standardization of volume allows for comparison of specific differences created by the interaction of sound and space. From this data, archaeologists can attempt to extrapolate the types of relationships that sound might afford within these spaces. Through the process of freezing and compressing space and time, the map allows for comparisons between different sounds, spaces, time periods and cultures. The transformation of lived ephemeral sound into fixed considered image affords Merleau-Ponty's process of analysis and directs researchers towards re-synthesis, and eventually knowledge.

Acoustic mapping opens up these varied avenues of inquiry but permanently shuts many others. The efficacy and emotional impact of sound derives from its presence, which arises from the use of energy in a specific moment that dissapates rapidly across space and over time. An acoustic map presents a static view of sound as it travels across space, a smooth and continuous view, a view seemingly frozen in time; though this image actually represents hours and even days of movement and energy as surveyors painstakingly transverse the landscape, recording information about monotonous and unpleasant sound. This is the fundamental transformation from sound to image: it converts the ephemeral into the durable, the moving into the static. The ephemeral can only be experienced, while the durable can be analyzed. Thus, subjectivity and objectivity possess differing temporalities: objective data, such as the decibel level readings presented in the acoustic map, creates a fixed, durable image of sound as it moves across both a built and natural landscape. Subjective observations only provide impressions of a specific moment.

In addition to removing sound from its temporality, the acoustic map presents sound in a way that no one human body could ever perceive and experience it, at all places simultaneously. Displaying sound as a fixed attribute of space, while affording analysis and comparison, permanently removes sound from its embodied experiential impact. The map not only freezes and compresses time, but it also compresses the experience of space as well. By divorcing sound from its fleeting temporality, the map image strips sound of much of its power; the power to move people emotionally, the power to affect memory and create community through shared experience. In one sense, this map presents synaesthesia in action, combining sound and vision into one easily transportable, easily comparable, but albeit, primarily visual object. In another, this creation is as far phenomenologically from sound as one could get. Does an acoustic map truly represent lived experience? Certainly not. A plan-view does not represent the lived experience of an archaeological site or architecture. This static image does not transmit the quality which makes sound the most efficacious: its presence, its ability to move through space and time and through its movement, elicit reactions and emotions from the listener.

Conclusion: acoustic objectification

The map serves as a keystone principle for archaeological practice (Shanks and Webmoor 2013). Striving to produce the most accurate visual representation of any given archaeological site, and all that might entail, has shaped the entire discipline, from the design and implementation of research projects, to excavation and recording methods, to the adoption of new technologies (Light Detection and Ranging, drone photography, photogrammetry, geographical information systems), to publication outputs. Julian Thomas (2008: 9) describes this process as ocularcentrism, "the valorisation of one sense over the others, based on taking one of the ways that we have of relating to the world, and identifying it as the paradigm of all sensory experience." Michael Shanks and Timothy Webmoor (2013: 96) advocate that: "it is better to think of archaeological work in a different way, not as mimesis, modeling, simulating, or representing, but as a fundamentally transforming mediation or translation, work done in the spaces between past and present." Archaeological maps do not preserve the past for posterity, they create something new in the present, something not mimetic of the past, but representing the present as influenced by the re-emergence of these past archaeological contexts. The acoustic map exemplifies the process of mediation and translation inherent to all archaeological practice, as it transforms an explicitly present experience of archaeological space into a durable two-dimensional visual artifact. The ability to marshal evidence in a concise and convincing way acts as one of the primary motivations driving the continued production of archaeological maps.

The acoustic map explicitly demonstrates the work that all maps perform, especially in this new era of "big data"; to argue for the presence or absence of things. James Corner (1999: 93) describes maps as gatherings of things presently invisible, but which taken as a whole may present new patterns and realties. He asserts that some phenomena can only achieve visibility through representation rather than experience (Corner (1999: 94). The past is one such phenomenon, as one can never directly experience the past, but maps can make visible aspects of past contexts in the present. Acoustic mapping explicitly exposes the temporal nature inherent to all mapping practices, but rarely acknowledged in archaeological practice. An archaeological plan-view represents only one specific temporal moment, the time of the excavation, not the "Pompeii effect" of a pristine preserved past. Acoustic mapping interrogates the absences on archaeological maps while simultaneously validating the ability of a map to make present specific phenomena. Acoustic mapping also draws attention to the dual role of the map as an argument in itself and as evidence in larger arguments and interpretations. Maps never simply function as objective "base data," a premise more archaeologists perhaps need to be aware of and question.

By smoothing out reality to emphasize specific effects, transforming lived experience into the abstract and objective, acoustic maps make sonic data comparable, but divorce it from any type of embodied experience. Analysis and interpretations performed by researchers must further transform these comparisons into narratives relevant to lived human experience. Archaeologists should remain vigilant to what is lost in this translation, the lived human experience of space and place. This may or may not be the objective of any particular mapping exercise, but any mapping exercise will impact the experience of space and place for present and future readers interacting with the resulting map. In this post-processual archaeological era, the divide between method and theory remains deep, with processes such as acoustic mapping attempting to bridge the divide, if only in small ways. What types of data are considered evidence in wider archaeological arguments are still firmly rooted in Western scientific practice, a practice that continues to value primarily visual outputs, and relies on the observations of non-human scientific instruments to produce data.

Bruno Latour, in *Visualization and Cognition: Drawing Things Together,* argues that the primary purpose of the laboratory is to translate the world into inscriptions; to transform "confusing three-dimensional objects" into two-dimensional images, "which have been *made less confusing*" (1986: 16, emphasis in original). Latour refers explicitly to writing, equations and figures, but mapping easily belongs in this category. Maps endeavor to simplify the world by only portraying parts deemed worthy of discussion and analysis. Within archaeological discourse, maps create order out of the chaotic and messy archaeological record. Focusing on only two aspects of the human experience, sound and space, the acoustic map argues that archaeologists can access sound in the past, can analyze and compare sonic experience, and, most importantly, that they should. Julian Thomas (2008: 9) articulates the enormous challenge faced by archaeologists investigating past sensory experience, writing that it "is not simply that of complementing its existing focus on the visual with a consideration of the other senses. On the contrary, we need to develop adequate conceptual tools for addressing modes of existence in which the visual is immersed in a more holistic form of dwelling." Despite its ephemeral nature, investigating sonic experience within past contexts can reveal a world of relationships hidden from view but nevertheless important to human experience, human action, and human interaction between themselves and the material world. Acoustic maps work within the ocurlarcentric archaeological discipline to legitimize the study of sound, but by displaying sound as a serious force in the world, they conversely argue for the expansion of archaeological methods to include considerations of ephemeral phenomena.

Notes

1 See Shafer (1977: 214–217) for a detailed description of acoustic space and the communities it can create.

2 130 dB equates to the volume of a modern jet engine, and causes hearing damage within minutes of close proximity exposure. The human voice can produce an average maximum volume of approximately 80–85 dB, as measured from a meter away (Sound Advice 2007).

3 dBa and dBc weightings, or adjustments, compensate for the difference between the totality of sound frequencies produced naturally and the sound frequencies humans possess the ability to hear. Additionally, the weightings counteract the fact that human beings perceive the loudness of high frequencies and low frequencies differently. In general, the dBa weighting compensates for the high frequency difference, giving a more accurate correlation between the decibel level reading and the perceived loudness of high frequency sounds (Mills 2014: 246). The dBc weighting indirectly compensates for the low frequency difference, giving a more accurate correlation between the decibel level reading and the perceived loudness of low frequency sounds (Mills 2014: 246). Even with these adjustments, decibel levels do not necessarily correlate directly to human perceived loudness, but instead allow for a standardization of sound intensity measurements across a space.

4 See Latour 2005 for an explanation of actor-network theory.

5 For a detailed discussion of this idea, see Latour (1987); Latour (1988); and Daston and Galison (2007).

6 Moche sonic artifacts roughly divide into types that produce predominantly high-frequency sounds: whistles, ocarinas, whistling vessels, bells, rattles, and panpipes; and types that produce predominantly low-frequency sounds: drums, trumpets, and *pututos* (shell trumpets).

7 See Figure 1 for comparisons.

8 This entrance is not shown on the maps presented here, which date to 2011.

References

Aitken, S., Craine, J. (2009) Into the Image and Beyond Affective Visual Geographies and GIScience. In: Cope, M., Elwood, S. (eds.) *Qualitative GIS: A Mixed Methods Approach*. Sage, London, pp. 139–155.

Bawden, G. (1999) *The Moche*. Blackwell, Oxford.

Bonde, S., Houston, S. (2013) Re-Presenting Archaeology. In: Bonde, S., Houston, S. (eds.) *Re-Presenting the Past: Archaeology Through Text and Image*. Oxbow, Oxford, pp. 1–7.

Bourget, S. (2010) Cultural Assignations during the Early Intermediate Period: The Case of Huancaco, Virú Valley. In: Quilter, J., Castillo, L.J. (eds.) *New Perspectives on Moche Political Organization*. Dumbarton Oaks Research Library and Collection, Washington, DC, pp. 201–222.

Canziani, J. (2010) City Planning and Architecture in the Analysis of Moche Social Formation. In: Quilter, J., Castillo, L.J. (eds.) *New Perspectives on Moche Political Organization*. Dumbarton Oaks Research Library and Collection, Washington, DC, pp. 159–180.

Castillo, L.J., Donnan, C.B. (1994) Los Mochicas del Norte y Los Mochicas del Sur. In: Makowski, K., Donnan, C.B. (eds.) *Vicús*. Colección Arte y Tesoros del Perú, Banco de Credito, Lima, pp. 143–181.

Castillo, L.J., Quilter, J. (2010) Many Moche Models: An Overview of Past and Current Theories and Research on Moche Political Organization. In: Quilter, J., Castillo, L.J. (eds.) *New Perspectives on Moche Political Organization*. Dumbarton Oaks Research Library and Collection, Washington, DC, pp. 1–16.

Corner, J. (1999) The Agency of Mapping: Speculation, Critique and Invention. In: Cosgrove, D. (ed.) *Mappings*. Reaktion, London, pp. 213–252.

Cosgrove, D. (ed.) (1999) *Mappings*. Reaktion, London.

Crampton, J. (2003) *The Political Mapping of Cyberspace*. Edinburgh University Press, Edinburgh.

Crampton, J., Krygier, J. (2006) An Introduction to Critical Cartography. *ACME: An International E-Journal for Critical Geographies* 4(1):11–33.

Daston, L., Galison, P. (2007) *Objectivity*. Zone Books, New York.

Del Casino, V., Jr., Hanna, S. (2006) Beyond the 'Binaries': A Methodological Intervention for Interrogating Maps as Representational Practices. *ACME: An International E-Journal for Critical Geographies* 4(1):34–56.

Dodge, M., Kitchin, R., Perkins, C. (2011) Preface: Introducing the Map Reader. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *The Map Reader: Theories of Mapping Practice and Cartographic Representation*. Wiley-Blackwell, Oxford, pp. xix–xxiii.

Donnan, C.B. (2010) Moche State Religion. In: Quilter, J., Castillo, L.J. (eds.) *New Perspectives on Moche Political Organization*. Dumbarton Oaks Research Library and Collection, Washington, DC, pp. 47–69.

Elwood, S. (2009) Multiple Representations, Significations and Epistemologies in Community-Based GIS. In: Cope, M. and Elwood, S. (eds.) *Qualitative GIS: A Mixed Methods Approach*. Sage, London, pp. 57–74.

Goodchild, G. (2009) Web Mapping 2.0. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 68–82.

Hall, E.T. (1966) *The Hidden Dimension*. Doubleday, Garden City, NY.

Haraway, D. (1991) *Simians, Cyborgs and Women: The Reinvention of Nature*. Routledge, New York.

Haraway, D. (1997) *Modest_Witness@Second_Millennium: FemaleMan©Meets_OncoMouse™: Feminism and Technoscience*. Routledge, New York.

Harley, J.B. (1989) Deconstructing the Map. *Cartographica* 26(2):1–20.

Harris, L., Harrower, M. (2006) Introduction: Critical Interventions and Lingering Concerns: Critical Cartography/GISci, Social Theory, and Alternative Possible Futures. *ACME: An International E-Journal for Critical Geographies* 4(1):1–10.

Harris, L., Hazen, H. (2006) Power of Maps: (Counter) Mapping for Conservation. *ACME: An International E-Journal for Critical Geographies* 4(1):99–130.

Harris, L., Hazen, H. (2009) Rethinking Maps for a More-Than-Human Perspective: Nature-Society, Mapping and Conservation Territories. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 50–67.

Hastings, C., Moseley, M. (1975) The Adobes of Huaca del Sol and Huaca de la Luna. *Latin American Antiquity* 40(2):196–203.

Ingold, T. (2000) *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. Routledge, London.

Inomata, T., Coben, L. (2006) Overture: An Invitation to the Archaeological Theater. In: Inomata, T., Coben, L. (eds.) *Archaeology of Performance: Theaters of Power, Community, and Politics*. AltaMira, New York, pp. 11–46.

Kitchin, R., Dodge, M. (2007) Rethinking Maps. *Progress in Human Geography* 31(3):1–14.

Kitchin, R., Gleeson, J., Dodge, M. (2013) Unfolding Mapping Practices: A New Epistemology for Cartography. *Transactions of the Institute of British Geographers* 38(3):480–496.

Kitchin, R., Perkins, C., Dodge, M. (2009) Thinking about Maps. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 1–24.

Knigge, L., Cope, M. (2009) Grounded Visualization and Scale: A Recursive Analysis of Community Spaces. In: Cope, M., Elwood, S. (eds.) *Qualitative GIS: A Mixed Methods Approach*. Sage, London, pp. 95–114.

Kolar, M. (2012) Ancient Pututus Contextualized: Integrative Archaeoacoustics at Chavín de Huántar, Peru. In: Stöckli, M., Both, A.A. (eds.) *Flower World: Mundo Florido*, Vol. 4. Ekho VERLAG, Berlin, pp. 23–54.

Krygier, J., Wood, D. (2009) Ce n'est pas le monde (This Is Not the World). In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 189–219.

Larco, R. (2001) *Los Mochicas*. Museo Arqueológico Rafael Larco Herrera, Lima.

Latour, B. (1986) Visualization and Cognition: Drawing Things Together. In: Kuklick, H. (ed.) *Knowledge and Society Studies in the Sociology of Culture Past and Present, Vol. 6*. JAI Press, Greenwich, pp. 1–40.

Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers Through Society*. Harvard University Press, Cambridge.

Latour, B. (1988) *The Pasteurization of France*. Harvard University Press, Cambridge.

Latour, B. (2005) *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford University Press, Oxford.

MacEachren, A.M. (1995) *How Maps Work: Representation, Visualization, and Design*. Guilford Press, London.

MacEachren, A.M., Kraak, M.-J. (1997) Exploratory Cartographic Visualization: Advancing the Agenda. *Computer & Geosciences* 23(4):335–343.

Merleau-Ponty, M. (1981) *Phenomenology of Perception*. Routledge, New York.

Mills, S. (2014) *Auditory Archaeology: Understanding Sound and Hearing in the Past*. Left Coast Press, Walnut Creek, CA.

Mlekuz, D. (2004) Listening to Landscapes: Modelling Past Soundscapes in GIS. *Internet Archaeology* 16. http://dx.doi.org/10.11141/ia.16.6

Moore, J.D. (1996) *Architecture and Power in the Ancient Andes*. Cambridge University Press, Cambridge.

Ong, W. (1967) *The Presence of the Word: Some Prolegomena for Cultural and Religious History*. Yale University Press, New Haven.

Pavlovskaya, M. (2009) Non-Quantitative GIS. In: Cope, M., Elwood, S. (eds.) *Qualitative GIS: A Mixed Methods Approach*. Sage, London, pp. 13–37.

Perkins, C. (2009) Playing with Maps. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 167–188.

Perkins, C. (2014) Plotting Practices and Politics: (Im)mutable Narratives in OpenStreetMap. *Transactions of the Institute of British Geographers* 39(2):304–317.

Pickles, J. (1991) Texts, Hermeneutics and Propaganda Maps. In: Barnes, T.J., Duncan, J.T. (eds.) *Writing Worlds: Discourse, Text and Metaphor in the Representation of Landscape*. Routledge, London, pp. 193–230.

Pickles, J. (2004) *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World*. Routledge, London.

Propen, A. (2009) Cartographic Representation and the Construction of Lived Worlds: Understanding Cartographic Practice as Embodied Knowledge. In: Dodge, M., Kitchin, R., Perkins, C. (eds.) *Rethinking Maps: New Frontiers in Cartographic Theory*. Routledge, London, pp. 113–130.

Quilter, J., Koons, M. (2012) The Fall of the Moche: A Critique of Claims for South America's First State. *Latin American Antiquity* 23(2):127–143.

Reznikoff, I. (2006) The Evidence of the Use of Sound Resonance from Palaeolithic to Medieval Times. In: Scarre, C., Lawson, G. (eds.) *Archaeoacoustics*. McDonald Institute for Archaeological Research, Cambridge, pp. 1–10.

Scarre, C., Lawson, G. (2006) *Archaeoacoustics*. McDonald Institute for Archaeological Research, Cambridge.

Schlichtmann, H. (ed.) (1999) *Map Semiotics Around the World*. International Cartographic Association, University of Regina, Regina.

Scullin, D. (2015a) *A Materiality of Sound: Musical Practices of the Moche of Peru*. Dissertation, Columbia University, New York.

Scullin, D. (2015b) What Do Moche Whistles Want? In: Stöckli, M., Howell, M. (eds.) *Flower World – Mundo Florido*, Vol. 4. Ekho VERLAG, Berlin, pp. 13–41.

Shafer, R.M. (1977) *The Tuning of the World*. Knopf, New York.

Shanks, M., Webmoor, T. (2013) A Political Economy of Visual Media in Archaeology. In: Bonde, S., Houston, S. (eds.) *Re-Presenting the Past: Archaeology Through Text and Image*. Oxbow, Oxford, pp. 85–108.

Shapin, S., Schiffer, S. (1985) *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton University Press, Princeton.

Sound Advice (2007) Noise Source Decibel Level Table. www.soundadvice.info/thewholestory/san12.htm Accessed 20 January 2017.

Staat, W. (1993) On Abduction, Deduction, Induction and the Categories. *Transactions of the Charles S Peirce Society* 29:225–237.

Thomas, J. (2008) On the Ocularcentrism of Archaeology. In: Thomas, J. and Oliveira Jorge, V. (eds.) *Archaeology and Politics of Vision in a Post-Modern Context*. Cambridge Scholars Publishing, Newcastle-upon-Tyne, pp. 1–12.

Till, R. (2009) The Sounds of Stonehenge. Centre for the History of Music in Britain, the Empire and the Commonwealth. CHOMBEC Working Papers No.1. BAR 504. Archaeopress, Oxford.

Toyne, J.M., White, C.D., Verano, J.W. Castillo, S.U., Millair, J.F., Longstaffe, F.J. (2014) Residential Histories of Elites and Sacrificial Victims at Huacas de Moche, Peru, as Reconstructed from Oxygen Isotopes. *Journal of Archaeological Science* 42:15–28.

Turnbull, D. (2003) *Masons, Tricksters and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge*. Routledge, London.

Uceda, S. (2005) Introducción. In: Uceda, S., Morales, R. (eds.) *Informe Técnico 2004 El Proyecto Aqueológico Huaca de la Luna*. Universidad Nacional de Trujillo, Trujillo, pp. 1–20.

Uceda, S. (2010) Theocracy and Secularism: Relationships between the Temple and Urban Nucleus and Political Change at the Huacas de Moche. In: Quilter, J., Castillo, L.J. (eds.) *New Perspectives on Moche Political Organization*. Dumbarton Oaks Research Library and Collection, Washington, DC, pp. 132–158.

Uceda, S., Armas, J. (1998) An Urban Pottery Workshop at the Site of Moche, North Coast of Peru. In: Shimada, I. (ed.) *Andean Ceramics: Technology, Organization and Approaches*. University of Pennsylvania, University Museum, Philadelphia, pp. 91–110.

Uceda, S., Mujica, E. (2004) El Proyecto Arqueológico Huacas del Sol y de la Luna diez años después: A manera de introducción. In: Uceda, S., Morales, R. (eds.) *Investigaciones en la Huaca de la Luna 1998–1999*. Facultad de Ciencias Sociales, Universidad Nacional de Trujillo, Trujillo, pp. 11–20.

Voeglin, S. (2014) *Sonic Possible Worlds: Hearing the Continuum of Sound*. Bloomsbury, London.

Waller, S.J. (2006) Intentionality of Rock-Art Placement Deduced from Acoustical Measurements and Echo Myths. In: Scarre, C., Lawson, G. (eds.) *Archaeoacoustics*. McDonald Institute for Archaeological Research, Cambridge, pp. 1–10.

Witmore, C. (2013) The World on a Flat Surface: Maps form the Archaeology of Greece and Beyond. In: Bonde, S., Houston, S. (eds.) *Re-Presenting the Past: Archaeology Through Text and Image*. Oxbow, Oxford, pp. 125–149.

Wood, D., Fels, J. (2008) *The Nature of Maps: Cartographic Constructions of the Natural World*. University of Chicago Press, Chicago.

Part 4

Digital transformations

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

12 Archaeology, digital cartography and the question of progress

The case of Çatalhöyük (Turkey)

Piraye Hacıgüzeller

> I believe that some sense of making progress is central to what we do. Without some belief in, and conception of, progress I find it difficult to see what would motivate most academic work.
>
> (Bassett 1999, p. 28)

> The world should be added to, not subtracted from.
>
> (Thrift 2005, p. 474)

Introduction

We can take it as read that, since the 1990s, digital maps and cartographic practices in archaeology have proliferated both in terms of quantity and type. This development has mainly to do with the increasing availability of Internet, wireless and digital cartographic technologies. Specifically, the Internet, coupled with wireless technologies, provided archaeologists with unprecedented opportunities to circulate, access, edit, consult and populate digital maps. Digital cartographic technologies (especially geographical information systems), on the other hand, have rendered the collection, storage, querying, processing and display of archaeological spatial data ever more efficient.

One of the most pressing questions to ask in this regard involves the progressive nature of the digital transition in archaeological cartography. Specifically, the issue is whether digital cartography can lead to, or has already led to, progress within archaeology and, if so, of what type of progress? This question matters particularly because progress as a concept is a contested one which may be reliant on hidden assumptions. As David Livingstone (2006, p. 559) puts it, "we live in a time obsessed with progress in research and ways of measuring it . . . At the same time, in what surely must count as one of the great intellectual reversals of recent times, the idea of progress has become deeply unfashionable in certain circles", where being cynical about the attempt to progress has become somewhat popular in some of the pragmatist, deconstructivist and constructivist contexts (see Bassett 1999). Whether we believe in the progress of archaeology in general, is a question that is increasingly valid but awaits a thorough discussion for the time being. For our argument here, it suffices to highlight that if not to improve things or make things better, there would be no point or motivation behind digital archaeology, archaeological digital cartography or, in fact, any other initiative within the discipline. And, if the aim of digital cartographic practices in archaeology is to improve things, then we need to know precisely how things are improving since there is a danger in normalising the pursuit of progress. Such normalisation might stop us from reflecting on what we mean by progress and take the progressive nature of things too much for granted, especially when historically the idea of and hope for progress is a prevailing characteristic of a certain domain, as in the case of Western scientific cartography. In fact, geographer Matthew Edney (1993) reminds us that the history of Western scientific cartography from the late-Renaissance until now is often told as a grand narrative of progress. In this idealised narrative, Western maps advance in representing the world "out there" ever more truthfully and objectively. As a result, archaeological cartography is at risk of being considered as a field mandatorily open to progress or even as a naturally progressing one. The situation is exacerbated further for archaeological digital cartography with digital data handling and mapping systems being considered "as the next logical, efficient, useful and hence necessary, step in the advance of science and society" (Pickles 2004, p. 154), that is, as yet another set of naturally progressive phenomena.

Against this background, the principal aim in this chapter is to approach the progressive nature of archaeological digital cartography critically through a discussion of some of its promises (novelty, speed, access to information) as well as through storytelling. The nexus of the "small stories" told in this chapter is a variety of mapping practices that took place during the 2013 archaeological fieldwork season at the Neolithic site of Çatalhöyük, Turkey. Through the occurrences, encounters, events, actions and dialogues they revive (Lorimer 2003), these personal accounts of mapping people at the site support the idea that another definition of progress in archaeological cartography is possible, i.e. one that does not merely dwell on novelty, speed and access to information. This new definition comprises enriching archaeological (cartographic) processes through diversification of practices and, hence, the relations involved. It, therefore, remains inclusive of paper-based cartography besides digital mapping.

Archaeology, cartography and the question of progress

Some progressive promises of digital cartography: novelty, speed and access

Digital cartography uses a newer logic than paper-based cartography and forms a new experience for people interacting with maps. People using digital maps are interacting with them in the sense that they "are not just reading maps, but are also to a far greater extent [than in the case of paper-based maps] . . . influencing the shape and look of the map itself" (Lammes 2015, p. 200). These ubiquitous practices of digital cartographic interaction involve actions (switching layers on or off, changing symbology, or scaling maps up or down) carried out in often fluid, open-ended, pre-cognitive, spontaneous, diverse, imaginative, frivolous and creative ways which could be considered playful (Lammes 2015; Perkins 2009; cf. Schechner 2006, Ch. 4, on playful performances). As such, creating "short-lived maps" that continuously change into other maps seems to have become a routine and even a fun part of contemporary mapping culture in the digital age (Silver and Balmori 2003; Perkins 2013, p. 304). Valerie November and others expand this point eloquently in their article "Entering a Risky Territory: Space in the Age of Digital Navigation" (2010). They argue persuasively that digital mapping is a clearer case of a "navigational" endeavour than paper-based cartography. Specifically, computer screens play the role of a dashboard in digital cartography, allowing the users to *navigate* through heterogeneous sets of data. The computer screens in this new experience interface with the users in both ways: while one can navigate through a vast sea of information, it is not only the information that gets to be visualised but also the user who gets the chance to feed information back to the database through the screen. Hence, through this two-way process facilitated by digital cartography, the categories of map users and map makers melt down and merge.

There is no reason to doubt November and others' suggestion: digital cartography offers a new logic and provides us with a new mapping experience, the dashboard analogy being only one. It may, however, be that it is this novelty itself that creates the idea or illusion of progress in archaeological cartography. This is a powerful illusion because when seeking to improve things, many of us are inclined to give "the new" the benefit of the doubt. As pointed out by the geographer David Ley (2003, p. 545), privileging the new over the old is related to the modern impulse "to value change over continuity", since in modern thought change aligns very closely with progress and continuity with tradition. This is a kind of thought process where, "commitment to progress has become equated with a commitment to innovation" and a kind of context where the new merits approval while the old is *passé* (Ley 2003, p. 547).

Digital cartography also enhances the speed of mapping and facilitates access to information; qualities often considered progressive. Specifically, digital cartography speeds up archaeological mapping processes, given that digital technologies allow easy production and manipulation of maps. Regarding easier access to cartographic information, digital cartographic technologies do not only facilitate a "democratisation of cartography" (Morrison 1997) through "widening access to mapping and breaking the rigid control of authorship by an anonymised professional elite" (Dodge et al. 2011, p. 119). They also make mapping practices and maps more ubiquitous due to the advent of mobile devices, cartographic software and the Internet (see Peterson 2008). As Perkins (2009, p. 168) states, in the digital age "new kinds of maps are being made; more people are making maps; more things are being mapped; and mapping is taking place in more contexts than ever before." As a result, more maps surround archaeologists before, during and after fieldwork thanks to all sorts of digital cartographic devices and technologies providing easier access to versions of the same map or cartographic dataset.

Obviously, increased speed and access to information are criteria much sought after in many archaeological projects working on tight budgets and/or seeking multi-vocality and reflexivity in the archaeological process. At the Neolithic site of Çatalhöyük, Turkey, for instance, which is the focus of storytelling in this article as presented further later, Ian Hodder (2014, p. 10) writes how the project has been moving towards paperless mapping with similar motivations: "[W]e expanded our experiment with paperless planning, using tablets, to over 10 excavation teams . . . The excavators soon got used to the very sensitive touch-screens, and many asserted that use of the tablets saved time and was more efficient than traditional methods. Using the tablets in the trenches also allows more information to be made available to excavators as they dig".

However, the relationship between speed, access to information and progress is not as straightforward as it may immediately appear. Geographer John Pickles (2004, p. 140) reminds us that these supposedly progressive qualities of digital cartography today only came to symbolize progress in 19th-century Europe. Regarding access to information in particular, he observes critically that: "Underpinning contemporary claims for the democratizing potentials of informatics and new imaging and mapping systems are several key assumptions. One is the western trope of a public space in which people . . . of good faith join in debate about their future. This promise and possibility of informed open discussion currently serves as a central trope and wish image of the informational economy. It suggests a putative openness of new electronic information media, a rhetoric of 'voice', 'access' and 'information', a trope of reasoned, open, uncoerced discourse in a public place" (Pickles 2004, p. 153). Pickles then goes on to stress in the same context how the democratising nature of digital cartography may be a myth given that it is still made possible through powerful forces of private property, capitalist forces and controlling state institutions. He underlines that new information and mapping systems are under an increasing control monopoly and "through differential access and use [exacerbate] old and [create] new patterns of social and economic differentiation", and uneven development (Pickles 2004, p. 154). As such, following Pickles's convincing argument, the access and speed provided by digital cartography may after all be naturalised as things we all should believe in and aspire to without thorough critical examination of how exactly they improve conditions for us, and at what cost.

Rethinking archaeological progress: a non-representational perspective

Yet if novelty, speed and access to information are not taken as proxies for progress in archaeological cartography, then what other conceptualisations of progress can be taken as such? My suggestion here is to redefine progress in terms of enriching archaeological (cartographic) processes through diversification of practices and, hence, the relations involved.

The choice of how best to effect this diversification in redefining cartographic progress is not to be a random one: it originates from non/post-representational thinking, which is proving useful in opening numerous new horizons in the social sciences and humanities today (cf. Anderson and Harrison 2010; Thrift 2008; Vannini 2015). Non-representational thinking/theory (NRT) welcomes as many practices and things as possible in its accounts of life and treats representations as presentations that are involved in constituting reality rather than truthful and objective reflections thereof. No representation can capture the essence of the world, as NRT stresses. In fact, capturing the essence of a world (which is considered to be continuously changing through representation) is rendered an old myth in NRT. Consequently, NRT considers all things and practices on equal footing when accounting for reality. There can then be no hegemony of certain representations and practices. And the more our practices become varied, the richer our worlds become as we get more actors involved and more relations enacted. Therefore, NRT can be defined as "a machine for multiplying questions and thereby *inventing new relations between thought and life*" as geographer Nigel Thrift puts it (2004, p. 71, emphasis added).

A first step in conceptualising an archaeological digital cartography progressing through diversification and the proliferation of relations would be retaining paper mapping for use together with digital mapping, rather than aspiring to paperless cartographic processes. Specifically, allowing paper and digital mapping processes to coexist at archaeological sites would be adding to the (variety of) relationships and, hence, experiences that archaeologists establish with their environment as part of cartographic processes. In this new framework of making progress in archaeological cartography, switching to exclusively paperless mapping during fieldwork would in fact constitute a regression, as it would render archaeological relations less varied than they could potentially be.

How archaeology impoverishes itself through a total digital cartographic transition is a point I want to stress further by reviving occurrences, encounters, events, actions and dialogues from the 2013 fieldwork season at Çatalhöyük by telling "small stories of mapping people" (see Lorimer 2003). Prior to that, however, we can start by setting the background for these stories through a brief overview of archaeological mapping as it took place in 2013 at Çatalhöyük.

Archaeological mapping and Çatalhöyük

Archaeological practices are inherently spatial: information about and documentation of the location of archaeological things, phenomena and practices are crucial components of archaeological fieldwork processes. Therefore, maps are ubiquitous within the discipline, both during fieldwork and at the post-excavation stage: “A map is one of the basic and most rudimentary tools for all archaeologists, and mapping is an inevitable field practice in any archaeological project” (Tomášková 2007, p. 275). As in other cartographic contexts (see Dodge et al. 2009), archaeological mapping is an untidy process that frequently shows considerable variation at the intra- and inter-site levels. This variation is created by unique and overlapping sets of relations of various types that can be referred to, for instance, as cultural, social, economic, archaeological, technical. These relations together comprise the archaeo-cartographic context and render a certain set of cartographic choices better than others at a specific time and place. The know-how and motivational knowledge of the project members, the project budget, the number of archaeological artefacts uncovered per day and the understanding of the people making decisions about the archaeological cartographic processes, as guided by their background knowledge, are all examples of relations that shape these cartographic choices at an archaeological site.

For a variety of reasons, it is often deemed necessary to maintain some level of standardisation in archaeological practices and representations; mapping and maps are no exception here. In general, high degrees of variation in archaeological practice sit uneasily in the discipline, which has historically embodied a desire to produce knowledge through standardised and repeatable methods (Thomas 2004). As in other contexts of Western science (Latour 1999, pp. 58–61; Turnbull 1997), the belief in standardisation in archaeology is derived from the need to compare within the process of knowledge creation: “without standardisation one cannot compare, and without comparison one cannot analyse or interpret” (Lucas 2001, p. 152). Moreover, in many archaeological contexts, visual documentation processes, including mapping, will often acquire value based on their efficacy in terms of speed, ease of operation, metric accuracy and archaeo-cartographic verisimilitude (Lucas 2001, pp. 206–211; Olsen et al. 2012, pp. 81–86; see Goodwin 1994; Webmoor 2005, pp. 72–73). Therefore, it should not be surprising that there is a tendency in archaeological fieldwork processes to choose the most efficacious (set of) mapping practices that is considered to work better or best for a particular archaeological site rather than allowing variations in practice to occur.

Against this background, it was unsurprising that, during the ethnographic study at Çatalhöyük which produced the small stories of paper and digital mapping presented next, mapping at the site was ubiquitous, vital for the archaeological process and varied, but governed by a strong proclivity for standardisation. Variation had been considerable at the site at the time because, since 2010, the project members had intentionally made the site a venue for experimenting with different types of computerised mapping, specifically with the ever-increasing involvement of photogrammetry, three-dimensional laser scanning and digital photographic modelling (Forte 2012, pp. 229–230; Forte et al. 2013). However, the ultimate aim during the fieldwork season was to curb this variation in mapping processes which involved, in particular, discontinuing paper mapping.

Through interviews with team members and reviewing reports on the fieldwork (e.g. Forte et al. 2013), it quickly became clear that Çatalhöyük was one of those contexts in which computers appeared "to offer unprecedented advantages in the quest for more accuracy and efficacy in map production" (Dodge et al. 2011, p. 117). More specifically, the general understanding at the site was that more cartographic accuracy, speed and operational comfort during fieldwork were forms of progress (i.e. change that brought improvement) and necessitated less (or no) paper mapping and more (or exclusive) computer mapping.[1]

As I intend to highlight next by telling the "small stories of mapping people", eradicating paper mapping in mapping arenas such as Çatalhöyük is not only about saving time and effort and creating ever more metrically accurate representations with archaeo-cartographic verisimilitude. Rather, the eradication process is also about making the "knowledge space" (Turnbull 1996) at Çatalhöyük devoid of a certain set of tools, skills, discourses, know-how, observations, discoveries, competences, personal relations, concerns, encounters, and understandings. In other words, a move towards paperless mapping at Çatalhöyük necessarily constitutes a move towards trimming the network across which the archaeological and cartographic knowledge generated at various parts of the site is assembled and moved (see Turnbull 1996; Latour 1999). Allowing paper and digital mapping to co-exist at the site, on the other hand, would be about assembling more "things" to this network, expanding the knowledge space and adding to the (variety of) relationships and, hence, experiences that archaeologists establish with their environments as part of the cartographic process.

It is important to note that we ultimately choose ourselves which of the two scenarios described in this chapter constitutes progress in an archaeological cartographic locale: efficacy in which accuracy, speed and ease of operation are key or a new type of efficacy that adds to the world of relations? There is no definitive truth. As long as we are convinced that multiplying the relations and experiences involved in cartographic processes constitutes an improvement in archaeological cartography, then inclusiveness towards paper mapping while adopting novel digital mapping practices in cartographic venues such as Çatalhöyük would be a progressive move. If, however, we feel uncomfortable with increased choice availability in the mapping arena and believe that multiplying the number of choices and relations would render the process of mapping fuzzy, slow, sloppy, inaccurate, expensive and more difficult, then the status quo will persist. John Law (2004, p. 141) states that in the end the choice between the certainty that comes with clear, definite and singular practices, and the uncertainties that flourish on less-coherent grounds "is a matter of metaphysics" in the sense that if we are not able to embrace uncertainty in archaeological practices then that is how it is.

The small stories told here of members of the Çatalhöyük team, Elisa Biancifiori, Scott Haddow, Erik Johansson and Allison Mickel, are of paper mapping, mapping with a tablet PC and of taking photographs for image modelling (which leads to two-dimensional maps after processing). These stories unquestionably constitute a small fraction of the various map-related webs of action that occurred at Çatalhöyük during the 2013 fieldwork campaign. Despite this limited scope, the stories will have served their primary purpose of narration here if they convey the heterogeneity of the relations these actions helped to spawn at the site. By helping present this heterogeneity as a positive outcome, these stories will, I hope, help to save paper mapping at other archaeological projects.

On a final note, the reason to call the stories below "small stories", following the geographer Hayden Lorimer (2003), is due to their mundaneness. These are stories of everyday events, localized accounts of fieldwork practice, from the Çatalhöyük 2013 fieldwork season. These are unapologetically modest stories. The stories effectively tell of relatively ordinary ways of doing things during archaeological fieldwork. Yet, it is exactly this familiarity that easily causes one to overlook these ordinary practices or the details of what they involve: different concerns, materials, discourses, skills, people, personal relations etc. It is due to the modesty of these stories that they manage to remind us of the rich and unique set of relations that constitutes the practices and processes at their core.

Mapping on Paper Allison and Erik were excavating at the end of July 2013 on a particularly warm day of fieldwork. The two were about to map the "fill" of a "grain bin" found in a Neolithic structure. The bin was made of mud containing numerous charcoal and barley grains. The mapping effort began by gathering the necessary materials – drawing board, graph paper, pencil, eraser, two tape measures and two pegs – and arranging them to perform the mapping process. Allison, holding the pencil and eraser, fixed the graph paper on the drawing board. In the meantime, Erik stretched a tape measure between two pegs that he had driven into the ground.

Each time Allison and Erik decided that a certain "point" had to be transferred to the map (e.g. corner of the bin), Erik took measurements with the tape measure and communicated the measurements to Allison, who subsequently placed a dot on the map accordingly. Each was dependent on the other in this process, in that Allison could not mark her map until Erik formulated a measurement and Erik would not move to the next measurement until Allison had notified him that she had marked the previous one on the graph paper.

To take each measurement, Erik first arranged his body suitably. Then, he placed the front end of the tape measure on the "point" of interest and stretched it to meet the baseline more or less orthogonally. Quotation marks for the word "point" are necessary here because although Allison was using "Cartesian discourse" to make her map and had points on her paper, there was no "point" for Erik in that pile of Anatolian dirt. He had to rely on his archaeo-cartographic gaze and imagination to keep pace with Allison's mapping and communicate information about the "points" he imagined to be "out there": "one 'o' six", he said, for example, and then added "and 90", two measurements read on two tapes. Hearing these two numbers, Allison knew exactly where she had to place a dot on the paper she held.

Making relevant measurements required negotiation between Allison and Erik. Was this or that related to the "bin fill"? Was it archaeologically significant? Would they have to place it on the map? While drawing, Allison would frequently move her right index finger along a line on the graph paper on which she had been drawing. Her finger would guide her eyes – and sometimes also Erik's – across the map. Afterwards, she would raise her head and use her index finger to identify and draw their attention to something "out there". With this gesture, she would enact a particular thing as prominent in the soil in front of her while leaving other features to fade into the background. Similarly, while talking to Allison, Erik would frequently point at things with his index finger or by using the end of the tape measure in his hand to set apart the "archaeologically significant" (see also Pickles 2004, p. 3).

Once mapping was finished, Allison and Erik stood next to one another and "checked" the map that they had produced. This process consisted of negotiating the mimetic quality of the map, i.e., its archaeo-cartographic verisimilitude. They were satisfied with the result and placed the map in a folder with a "graphics number" to be archived later in the excavation house.

Mapping with Tablet PC Another member of the Çatalhöyük team, Elisa, was mapping the plaster coating of a "platform"[2] in a Neolithic building using a tablet PC. Elisa was a member of a team at Çatalhöyük that aimed to research the possibilities of paperless mapping at the site (cf. Forte et al. 2013).

Elisa first took a few photographs of the platform, some of which she would eventually choose to rectify using geographic information system software. While taking the photographs, she kept the screen of the tablet PC, which had an internal camera, as parallel as possible to the ground to increase the metric accuracy of the subsequent rectification process. For the same reason, she also tried to include as many photogrammetric fix-points as possible in each photograph. She had decided on the location of these points and marked them with small pins on the ground so that they would show up easily in the photographs to be rectified.

After taking the photographs, Elisa sat down at the edge of the excavation area to complete the process all alone. She moved the stylus in her right hand over the screen to rectify the image on it. She then traced the borders of the plaster layer as a polygon and added attribute information to the polygon so that it could later be retrieved by the team members. Her skill with the tablet

PC was unmistakable; her fingers virtually flew across the screen. She identified the border of the plaster coating in the photograph easily as well after revisiting the platform several times to confirm her conclusions. Of course, any surprise regarding Elisa's skill in carrying out the process of tablet PC mapping would be surprising as she had been excavating and undertaking digital mapping at Çatalhöyük for two field campaigns.

From Photography and 3D Models to Digital Maps Scott Haddow was going to the site to take photographs of a human burial found under a platform in yet another Neolithic house on the last day of excavations at Çatalhöyük that year. Scott was a member of the "human remains team" responsible for identifying and documenting the human skeletal remains uncovered. He performed the documentation using 3D image modelling, which eventually allowed him to generate ortho-photos for digital mapping. Both modelling and ortho-photo creation were performed on a computer at the dig house.

When Scott and I arrived at the burial site, I saw that the skeletons he would model had already been unearthed and left in their original positions for modelling and mapping. While looking into the pit with human skeletons, he explained that an adult and baby had been buried there together. He then described how he had removed the skeleton of the baby earlier that day, which had been buried on top of the adult. He clarified that he had removed the skeleton of the baby only after 3D modelling both skeletons together. Now, he sought to model the adult skeleton alone.

Scott began the modelling process by preparing an information board. He wrote the metadata for the 3D model and the photographs he was about to take on it (e.g. the date on which he took the photographs, the "archaeological unit number" of the skeletons, and the "archaeological building number" in which the burial was found). He then placed the board just outside of the burial pit so that the information on it could be seen in the first few photographs he took, which, he told me, would be "regular recording photos". After these first few photographs, he removed the information board and took more photographs to be used in publications and for archival purposes.

Next, it was time to take the photographs for the 3D modelling. With the relatively large camera in his hands and frequently in front of his face, Scott stood, stepped backwards and forwards, bent, straightened again, crouched, and laid down on his abdomen, making his camera hover over the skeleton. In all his various positions, the camera was connected to his body. Scott's body must have once been resistant to the series of movements that I observed that day; however, that was surely no longer the case. Over time and with the countless repetition of similar postures, it must have become easier for him to shape his body-with-camera in accordance with his archaeological photographic intentions. When I asked him about the logic he used to position himself and take the photographs, he told me that he was following a trajectory in the shape of a spiral; the centre of the spiral would roughly correspond to the centre of the burial. He continued to explain that his purpose was to ensure that he covered all the perspectives such that the model would be complete. Another concern that he noted was the visibility of the photogrammetric fix-points pinned to the soil. Scott, much as Elisa in the case of tablet PC mapping, required these fix-points. In his case, it was for creating the 3D model of the skeleton in a metrically accurate way later in the excavation house. "I try to make sure that I have these targets in as many of the photos as possible", he explained. "It doesn't have to be in every photo but I need to have . . . if I take about . . . I probably take about forty pictures, and I need to have each target in about nine or ten of the photos" he continued. Otherwise, the geometry of the model would not be computed properly by the software.

Concluding notes

Different gestures, different material engagements, different concerns, different conversations, different skills . . . this was the rich archaeological context in terms of cartographic practices and experiences in July 2013 at Çatalhöyük, where paper and digital mapping co-existed. As we saw in the quote from Ian Hodder in the 2014 archive report, however, paper-based mapping was then on its way out at Çatalhöyük, as it is today at many other archaeological sites. Is this a good thing? The story of Allison and Erik told above on paper-based mapping shows us that eradicating this type of practice at Çatalhöyük is not simply about making more-accurate maps more easily and speedily. It is an important decision that changes how the site is re-assembled as an entity through repetitive practices. Without paper-based mapping, Çatalhöyük is rendered devoid of a certain arrangement of drawing boards, graph papers, tape measures, erasers and pencils by skilled bodies; of creative imaginings that facilitate acting out verisimilitude between a gridded and marked up graph paper and a pile of dirt; of particular types of conversations, negotiations and gestures that enact archaeologically significant, epistemological objects such as a corner or edge of a bin fill; of endless insecurities about accuracy due to a lack of trust in the human body as an instrument of science (cf. Daston and Galison 2007).

Performing Çatalhöyük more homogeneously by eradicating paper-based mapping on site can feel like a regress rather than progress when we start to mourn all these things that disappear with practices of mapping on paper. The aim could have been making them stay and enrich the processes through which Çatalhöyük is re-enacted and re-assembled as an entity. That is, they could have been valued to make a more heterogeneous Çatalhöyük enacted through a larger set of relations, relying on a larger set of experiences. In the end, though, it is we archaeological practitioners who will choose how to define progress in archaeology and, accordingly, the path we take to improve the discipline. Novelty, speed and access to information during the cartographic process can be considered a form of progress in archaeology but, as argued here, multiplying cartographic relations and, hence, experiences in archaeology might be just as valuable. So, the argument in here is not against digital cartography itself but against a digital cartography that remains exclusive towards and, hence, tries to dislodge paper-based cartography from archaeological fieldwork.

Acknowledgements

This paper was written as a Marie Curie Fellow of the Gerda Henkel Foundation at the University of Oxford while working on a project titled "Archaeology and the Map: From Critique to Practice". I would like to thank Gary Lock for the support and supervision he provided in the process of carrying out this research project. My thanks also go to Frank Carpentier for feedback, as well as members of the Çatalhöyük Research Project mentioned in the article as actors of "small stories" for their participation, and Ian Hodder for his support and encouragement.

Notes

1 An additional concern regarding the preference for computerised cartography at the site was the improvement of "archaeological reflexivity" (cf. Berggren and Hodder 2003; Berggren 2014). Computerised mapping was expected to further empower archaeologists by enriching the information available to them during fieldwork. The presence of tablet PCs at the excavation site would enable the archaeologists to immediately access previous maps and, therefore, to see things in a broader context (A. Mickel pers. comm.). Concerns about archaeological reflexivity at Çatalhöyük, however, are of a different nature than concerns about accuracy, speed and ease of operation on site. Specifically, the improvement of archaeological reflexivity does not require excluding paper mapping from the site but merely making digital versions of maps available during fieldwork through the use of tablet PCs. Hence, increased archaeological reflexivity is not part of the argument made for paperless mapping on the site and is therefore omitted from this discussion.

2 Platforms are plastered features found in Neolithic houses in Çatalhöyük that are slightly raised above the floor level. They are typically located against walls. They have been found in various sizes and quantities on the site. Many of these platforms featured human burials below them (cf. Çatalhöyük 2014).

References

Anderson, B., & Harrison, P. (eds.) (2010). *Taking place: Non-representational theories and geography*. Farnham: Ashgate.

Bassett, K. (1999). Is there progress in human geography? The problem of progress in the light of recent work in the philosophy and sociology of science. *Progress in Human Geography*, 23(1), 27–47.

Berggren, Å. (2014). Development of reflexive approaches in archaeology. In C. Smith (Ed.), *Encyclopedia of global archaeology* (pp. 6249–6257). New York: Springer.

Berggren, Å., & Hodder, I. (2003). Social practice, method, and some problems of field archaeology. *American Antiquity*, 68, 421–434.

Çatalhöyük (2014). Çatalhöyük: Excavations of a Neolithic Anatolian Höyük. www.catalhoyuk.com. Accessed 24 February 2017.

Daston, L., & Galison P. (2007). *Objectivity*. New York: Zone Books.

Dodge, M., Kitchin, R., & Perkins, C. (2011). Introductory essay: Technologies of mapping. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *The map reader: Theories of mapping practice and cartographic representation* (pp. 116–121). West Sussex: Wiley-Blackwell.

Dodge, M., Perkins, C., Kitchin, R. (2009). Mapping modes, methods and moments: A manifesto for map studies. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *Rethinking maps* (pp. 220–243). London: Routledge.

Edney, M.H. (1993). Cartography without 'progress': Reinterpreting the nature and historical development of mapmaking. *Cartographica*, 30, 54–68.

Forte, M. (2012). 3D digging project. In *Çatalhöyük 2012 archive report* (pp. 226–35). www.catalhoyuk.com/sites/default/files/media/pdf/Archive_Report_2012.pdf. Accessed 24 February 2017.

Forte, M., Dell'Unto, N., & Lercari, N. (2013). 3D digging projects: Season 2013. In *Çatalhöyük 2013 archive report* (pp. 212–219). www.catalhoyuk.com/sites/default/files/media/pdf/Archive_Report_2013.pdf. Accessed 24 February 2017.

Goodwin, C. (1994). Professional vision. *American Anthropologist*, 96(3), 606–633.

Hodder, I. (2014). 2014 season review. In *Çatalhöyük 2014 archive report* (pp. 7–10). www.catalhoyuk.com/sites/default/files/media/pdf/Archive_Report_2014.pdf. Accessed 24 February 2017.)

Lammes, S. (2015). Digital cartographies as playful practices. In V. Frissen, S. Lammes, M. de Lange, J. de Mul, & J. Raessens (Eds.), *Playful identities: The ludification of digital media cultures* (pp. 199–210). Amsterdam: Amsterdam University Press.

Latour, B. (1999). *Pandora's hope: Essays on the reality of science studies*. Cambridge, MA: Harvard University Press.

Law, J. (2004). *After method: Mess in social science research*. London: Routledge.

Ley, D. (2003). Forgetting postmodernism? Recuperating a social history of local knowledge. *Progress in Human Geography*, 27, 537–560.

Livingstone, D.N. (2006). Putting progress in its place. *Progress in Human Geography*, 30, 559–579.

Lorimer, H. (2003). Telling small stories: Spaces of knowledge and the practice of geography. *Transactions of the Institute of British Geographers*, 28, 197–217.

Lucas, G. (2001). *Critical approaches to fieldwork: Contemporary and historical archaeological practice*. London: Routledge.

Morrison, J.L. (1997). Topographic mapping in the twenty-first century. In D. Rhind (Ed.), *Framework for the world* (pp. 14–28). Cambridge: Geoinformation International.

November, V., Camacho-Hübner, E., & Latour, B. (2010). Entering a risky territory: Space in the age of digital navigation. *Environment and Planning D: Society and Space*, 28(4), 581–599.

Olsen, B., Shanks, M., Webmoor, T., & Witmore, C. (2012). *Archaeology: The discipline of things*. Berkeley: University of California Press.

Perkins, C. (2009). Playing with maps. In M. Dodge, R. Kitchin, & C. Perkins (Eds.), *Rethinking maps* (pp. 167–188). London: Routledge.

Perkins, C. (2013). Plotting practices and politics: (Im)mutable narratives in OpenStreetMap. *Transactions of the Institute of British Geographers*, 39(2), 304–317.

Peterson, M.P. (2008). Trends in internet and ubiquitous cartography. *Cartographic Perspectives*, 61, 36–49.

Pickles, J. (2004). *A history of spaces: Cartographic reason, mapping and the geo-coded world*. London: Routledge.

Schechner, R. (2006). *Performance studies: An introduction* (2nd ed.). London: Routledge.

Silver, M., & Balmori, D. (eds.) (2003). *Mapping in the age of digital media: The Yale symposium*. West Sussex: Wiley-Academy.

Thomas, J. (2004). *Archaeology and modernity*. London: Routledge.

Thrift, N. (2004). Intensities of feeling: Towards a spatial politics of affect. *Geografiska Annaler. Series B, Human Geography*, 86(1), 57–78.

Thrift, N. (2005). From born to made: Technology, biology and space. *Transactions of the Institute of British Geographers*, 30, 463–476.

Thrift, N. (2008). *Non-representational theory: Space, politics, affect*. London: Routledge.

Tomášková, S. (2007). Mapping a future: Archaeology, feminism, and scientific practice. *Journal of Archaeological Method and Theory*, 14, 264–284.

Turnbull, D. (1996). Cartography and science in early modern Europe: Mapping the construction of knowledge spaces. *Imago Mundi*, 48, 5–24.

Turnbull, D. (1997). Reframing science and other local knowledge traditions. *Futures*, 29, 551–562.

Vannini, P. (ed.) (2015). *Non-representational methodologies: Re-envisioning research*. London: Routledge.

Webmoor, T. (2005). Mediational techniques and conceptual frameworks in archaeology: A model in 'mapwork' at Teotihuacan, Mexico. *Journal of Social Archaeology*, 5(1), 52–84.

13 Cartography and quantum theory

In defence of distribution mapping

Christopher Green

Distribution mapping in archaeology: a perceived problem

This paper was written whilst working on the English Landscapes and Identities Project (EngLaId) at the University of Oxford. During my time working on EngLaId, I have been confronted with two things: my own improvement as a cartographer (by which I mean a maker of maps) over a substantial period of my life (see next); and how to gestate years of experience into guidelines for the somewhat less-practiced members of the project team, employed to work with GIS and maps on an almost daily basis but mostly with little formal cartographic training. Alongside the rest of the project team, I have also spent a great deal of time pondering how to present the extremely complex and characterful data of the project to academic and public audiences (Green 2013; Cooper & Green 2016): the main EngLaId database contains more than 900,000 records of English archaeological remains from the Middle Bronze Age (c.1500BC) to the end of the early medieval period (c.AD1000), including an almost unquantifiable large element of duplication due to its origin in a multiplicity of source datasets. Turning this complexity into a series of comprehensible messages is a difficult task (Green *et al.* 2017).

If we ignore a childhood spent doodling maps of imagined lands, my first real experience of formal cartography came as an undergraduate archaeology student at the University of Durham. As I would imagine is the case with many archaeologists (and indeed many geographers), I first encountered GIS as a map-making tool (obviously it is also much more, but this paper only considers the cartographic aspects of GIS) as part of a course on computers and computing in archaeology. I recall little formal teaching on good map design, and maps that I subsequently made for my dissertation, which was an attempt to construct a “mental geography” of Roman Britain, show a considerable cartographic naivety (Figure 13.1): amongst several errors, note the excessively large north arrow and the use of a fractional scale for a map which would inevitably be resized in the final document (thus making the scale incorrect, as it also is here).

This, then, is the situation in which many archaeologists find themselves: forced to make maps as part of their projects or employment, but with little

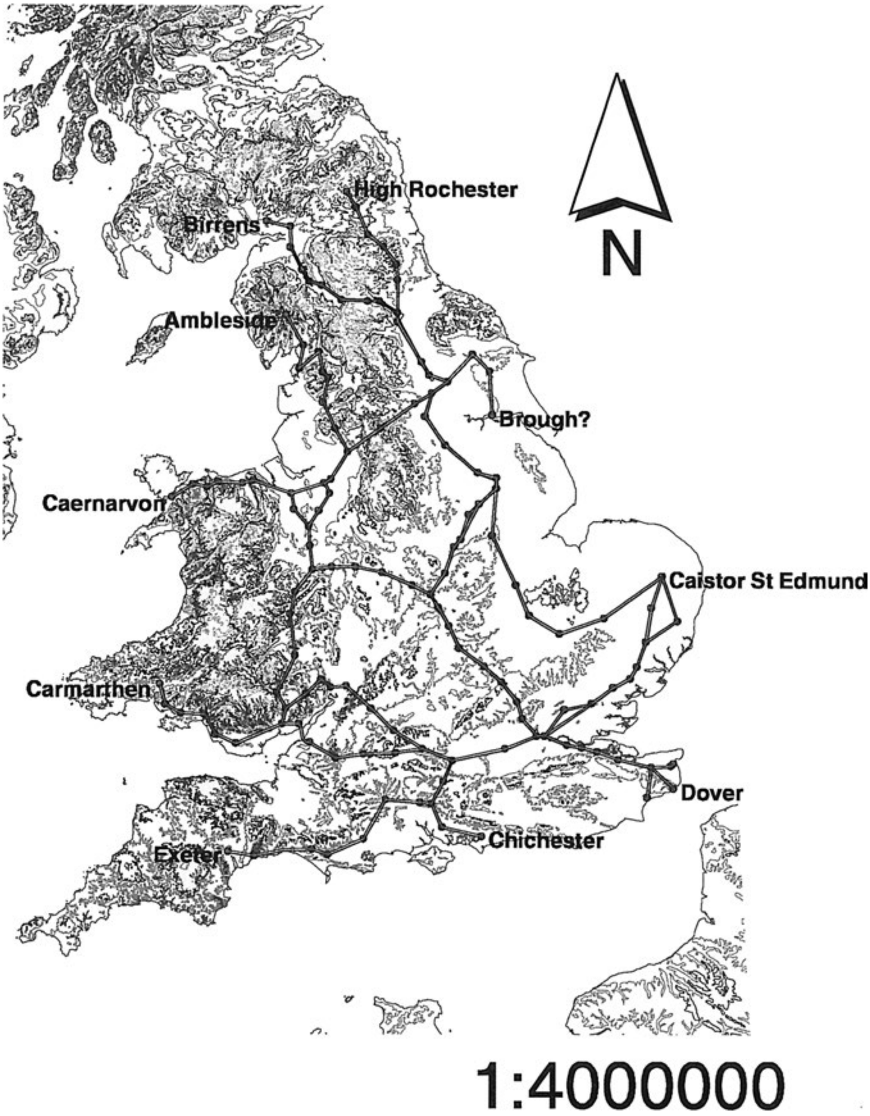

High Rochester
Birrens
Ambleside
Brough?
Caernarvon
Caistor St Edmund
Carmarthen
Dover
Chichester
Exeter
N
1:4000000

Figure 13.1 Map created by the author in 1999 as part of his undergraduate dissertation. The lines depict routes in the Antonine Itinerary (after Rivet & Smith 1979).

expertise in what we might call good cartographic practice and with little opportunity to learn other than through trial, error, and repeated effort, especially in the academic sector (more structured training and formal cartographic guidelines may be provided in the commercial sector – Victoria Donnelly, *pers. comm.)*. One consequence of this is the mistaken orthodoxy of certain prescribed practices, such as “a map should always have a scale bar” (Wood 2003: 7): many commonly used map projections (including the still very widely used modern derivatives of Mercator) do not preserve distances and so adding a scale bar to a map of large areas of Earth created in such a projection is simply incorrect (as measured distance will vary across the map) (Figure 13.2).

Another consequence of cartographic naivety is the widely heard verbal (albeit rare in print) complaint that mapping distributions is “just putting dots on maps”. Although it may often be correct to say that dots can be a poor way of representing extended areas of past settlement (Evans 2000: 3), that is essentially a question of the scale at which one works. Scale is, in fact, key herein and we shall return to the issue later. One form of distribution

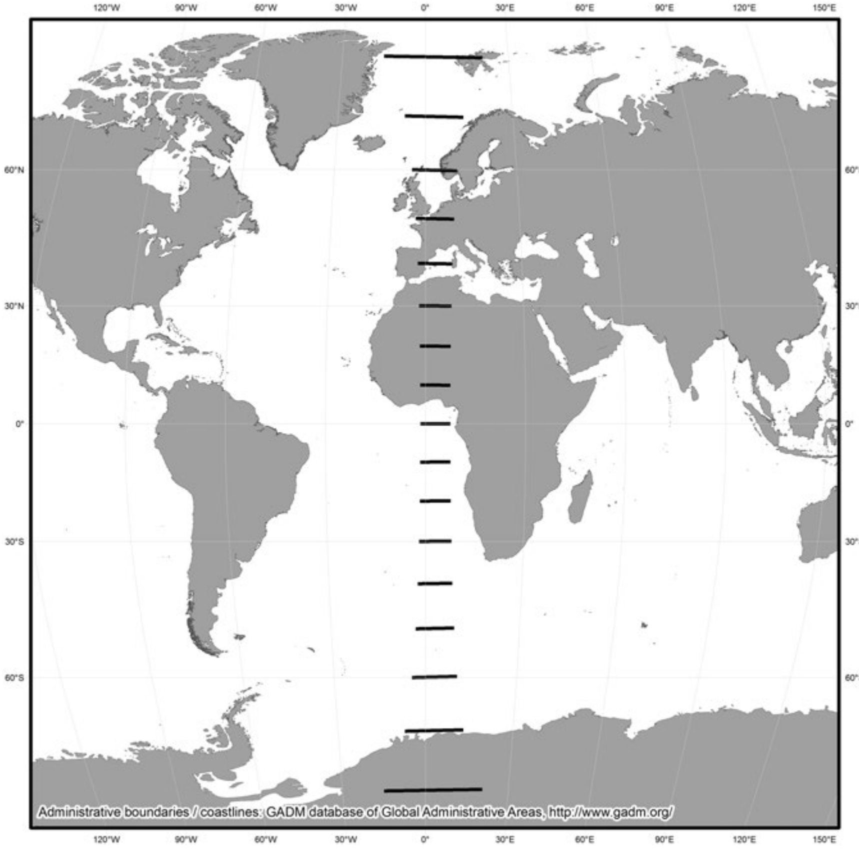

120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
Administrative boundaries / coastlines: GADM database of Global Administrative Areas, http://www.gadm.org/

Figure 13.2 Map of the world rendered in the very commonly used “WGS84” projection setting in ArcMap. Thick black lines are of 1000 km length illustrating the incorrectness of adding a scale bar to such a map (or at least just a single one). Contains data derived from the GADM Database of Administrative Areas (www.gadm.org/)

mapping for which complaints of being “just dots on maps” are somewhat justifiable are the very common phenomenon of “sites referred to in the text” (another mistaken orthodoxy), at least where no spatial context is given beyond a coastline and perhaps major rivers. Without sufficient context (an issue we shall return to), such maps are largely without merit, as they will be of little practical use to readers who do not already possess a strong knowledge of the geography of the area mapped: a gazetteer with grid references would be far more useful if a reader wished to subject results to further data analysis. At the very least, a distribution of all sites of the same type should be included, rather than simply those chosen by the author to write about: without that, any conclusions drawn by a reader (or the author) regarding the distribution of the sites discussed will be entirely meaningless.

In part, criticism of distribution mapping arises out of the wider phenomenon of postmodern critique, specifically seen in archaeology in the tension between so-called phenomenological and Cartesian approaches (Sturt 2006: 121): maps are seen as a tool of positivism, providing a restricting and classificatory top-down perspective at odds with lived experience on the ground in the real world. Yet the recovery of lived experience of the past is an impossible dream. Crampton states that there is, to the postmodern eye, something unseemly about maps (2010: 6):

> These wretched unreconstructed things seem to work so *unreasonably well*!
>
> (original emphasis)

Crampton accepts that maps enabled many abhorrent elements of the modern age, such as colonialism, racism, warfare, espionage, and that GIS is seen by some as a Trojan Horse for the return of positivism. Yet, he states that this is not exclusively true of maps but also of many other things. Like the power of the atom, maps can be used for beneficial as well as unfortunate purposes (Crampton 2010: 6–7). Maps in and of themselves, then, are not part of the problem: how we use them and how we construct them are the real issues. Making a map involves an inevitable task of classification and simplification of real world phenomena, but this can as easily be approached as a subversive act as it can as an act designed to promote an imperialist (whether colonial or economic) agenda.

Map making in a digital world

Through the 20th and early 21st centuries, the practice of making maps (alongside GIS generally) became increasingly divorced from both geography and cartography as academic subjects, to the extent that people who never made maps (e.g. lecturers) could claim to be cartographers (Crampton 2010: 2). Conversely, it is now possible for any person with a computer and access to the Internet to make a map: cartography as a practice has opened up to the public and escaped from its academic confines, aided by practices such as "map hacking" and "mash-ups" (Gartner 2009) and software such as Google Earth (Collins 2013). However, this democratisation is highly dependent upon access to computers and information technology expertise (Crampton & Krygier 2006: 12, 18–19; Field & Demaj 2012: 70). Today, the use of maps and spatial technologies has never been more common and more widespread (Crampton 2010: 11), immanent in the continually strengthening "geo-lifestyle" revolution (Field 2009: 59).

Some celebrate what they see as the death of cartography as an academic subject (see Wood 2003 for a wonderful polemic on the question), although as a practice it has never been healthier (Crampton 2010: 24). Academic journals on the subject and on GIS more widely are now largely dominated by technical issues rather than the aesthetic or the political (Crampton 2010: 5), whereas the people actually making maps have changed, now including data artists, journalists, and coders. Non-cartographers have always made fine maps from time to time (e.g. Harry Beck's Tube map, Charles Minard's map of the advance of Napoleon into Russia [Figure 13.3], or John Snow's epidemiological map of cholera in London), but the world is now awash with maps made by untrained map makers (Field 2015: 93). This should be seen in a positive light, with cartography as a practice slipping from control of the elites who have dominated it for centuries (Crampton 2010: 40) in what Field drolly calls (2014: 1) "a cacophony of cartography . . . a harsh, often discordant mixture of the weird and the wonderful."

The reaction within the academic fields of cartography and GIS to democratisation of cartographic practice has been less positive in many cases. Professions with power organise and force through legislation to protect their positions (e.g. law or medicine), whereas weaker professions create certification criteria and denigrate the output of non-professional rivals (Wood 2003: 5). Cartography and GIS fall into the latter category, as seen in the existence of the GIS Certification Institute in the USA (Crampton 2010: 36). This rather parallels the role of the Chartered Institute for Archaeologists[1] (CIfA) in British archaeology: like archaeologists, any person can now claim to be a cartographer, which some find discomfiting. Systems of ethics (Dent *et al.* 2009) and guidelines (Southworth & Southworth 1982) for "good" map design exist (MacEachren 1995; Monmonier 1996; also Tufte 2001 for data visualisation more widely), but are largely ignored by untrained makers of maps, causing professional cartographers to call for a return to best practice (Field 2005, 2014; Kent 2005: 187).

To return to the example of my own career, from 2001 to 2002 I studied for an MSc in GIS within a Geography department. There, I learned a great deal more about GIS and about making maps (including cartography taught as visualisation – Field 2005: 81). However, the great majority of my peers had been through the undergraduate Geography degree and, as such, certain key concepts were not covered in a great deal of detail (particularly map projections). In 2005, I commenced a PhD looking at the representation of

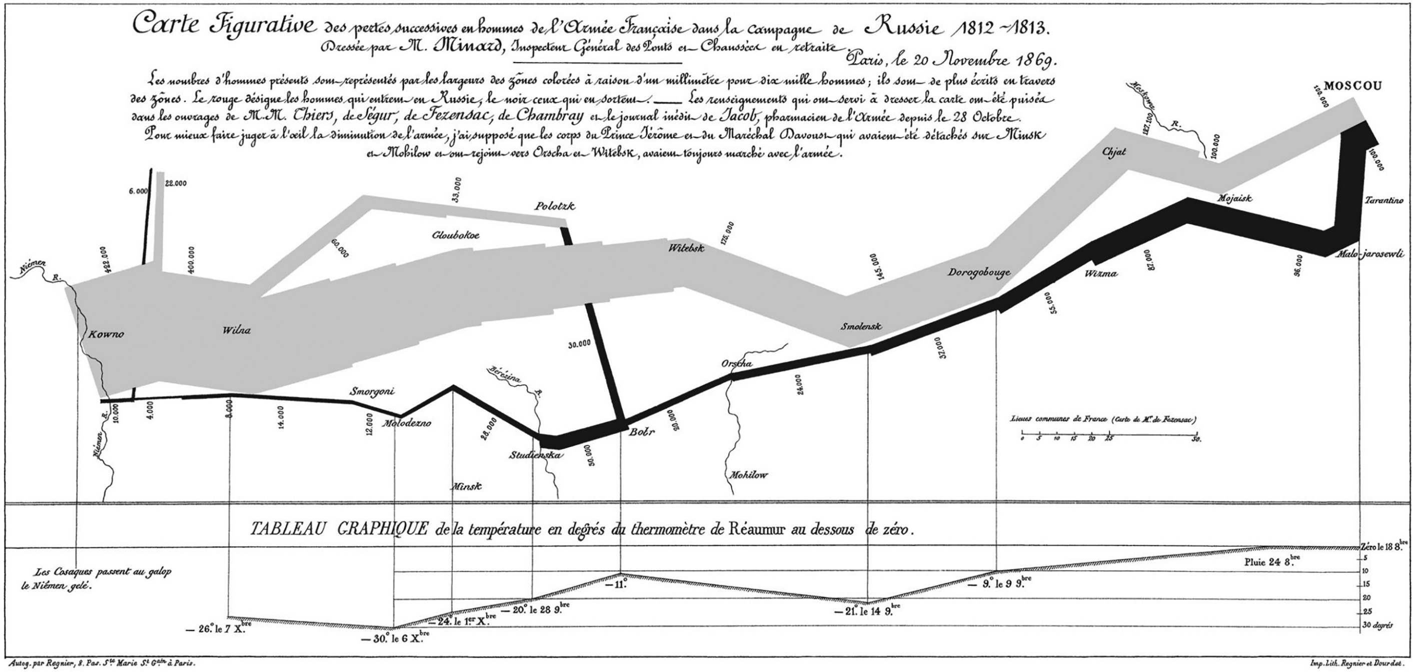


Figure 13.3 Charles Minard's 1869 map of Napoleon's Russian campaign of 1812–3, showing the successive losses of soldiers along the route. This is a public domain image obtained via Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Minard.png).

time in archaeological GIS (published as Green 2011). In the course of that piece of work, I made a great many more maps and my cartographic skills improved (Figure 13.4). However, I still made mistakes, albeit ones that might be less apparent at first glance: in Figure 13.4, note the division of the first four sections of the scale bar into 2.5 km units (five 2 km units would perhaps be more logical) and the spurious precision of the values in the legend. I also dislike the ArcMap default American spelling of "Kilometers". Furthermore, it would have been better to extend the extent of the trend surface to the full bounds of the county so that there were no white areas within the boundary polygon.

The point of this autobiographical example is that even with training and practice, those engaged in map production may still make mistakes, which in some cases might confuse the message being communicated. They may sometimes only be obvious to experienced cartographers, but the key message here is that no map can ever be perfected to the taste of all audiences. Those without formal training in cartography might make more mistakes or produce maps that fail to please the cartographic profession, but their ability to produce new insights should be embraced. It is clearly not possible, nor

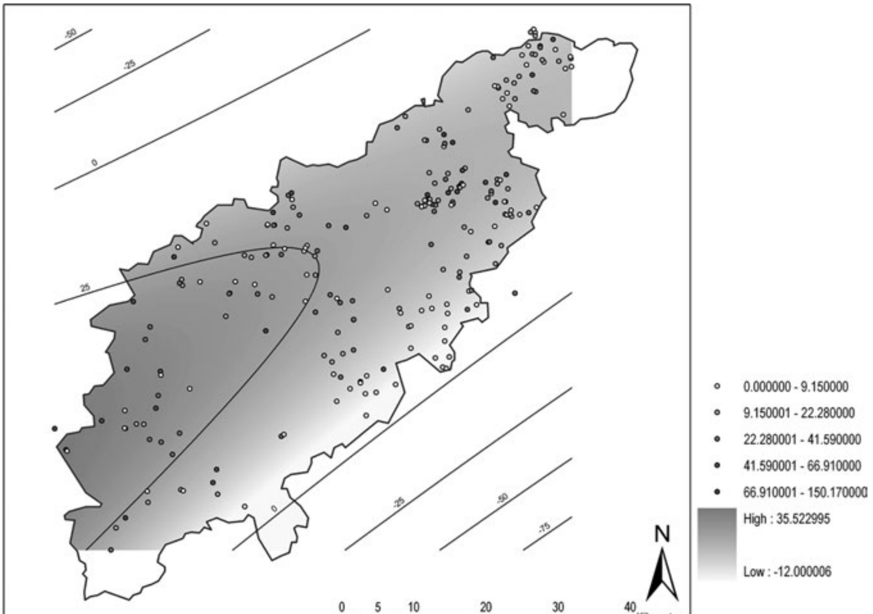


Figure 13.4 Map created by the author in 2008 for his PhD thesis (later published as Green 2011). The trend surface shows a model of pottery deposition in Northamptonshire between AD115 and 240. This image contains data derived from Jeremy Taylor's unpublished PhD thesis, originally gathered by David Hall.

probably desirable, to provide cartographic training to every person who now wishes to make a map, but some form of guidance is needed if people are to produce comprehensible output. For that guidance, we can find inspiration in what is perhaps an unlikely arena: quantum theory.

The Uncertainty Principle

The Uncertainty Principle, formulated by Heisenberg (1927), forms one of the foundational elements of the field of quantum mechanics. Stephen Hawking described its effects eloquently (2011: 62–63):

> In order to predict the future position and velocity of a particle, one has to be able to measure its present position and velocity accurately. The obvious way to do this is to shine light on the particle. Some of the waves of light will be scattered by the particle and this will indicate its position. However, one will not be able to determine the position of the particle more accurately than the distance between the wave crests of light, so one needs to use light of a short wavelength in order to measure the position of the particle precisely. Now . . . one cannot use an arbitrarily small amount of light; one has to use at least one quantum. This quantum will disturb the particle and change its velocity in a way that cannot be predicted. Moreover, the more accurately one measures the position, the shorter the wavelength of light that one needs and hence the higher the energy of a single quantum. So the velocity of the particle will be disturbed by a larger amount. *In other words, the more accurately you try to measure the position of the particle, the less accurately you can measure its speed, and vice versa.* Heisenberg showed that the uncertainty in the position of the particle times the uncertainty in its velocity can never be smaller than a certain quantity, which is known as Planck's constant. Moreover, this limit does not depend on the way in which one tries to measure the position or velocity of the particle, or on the type of particle: Heisenberg's uncertainty principle is a fundamental, inescapable property of the world.
>
> (my emphasis)

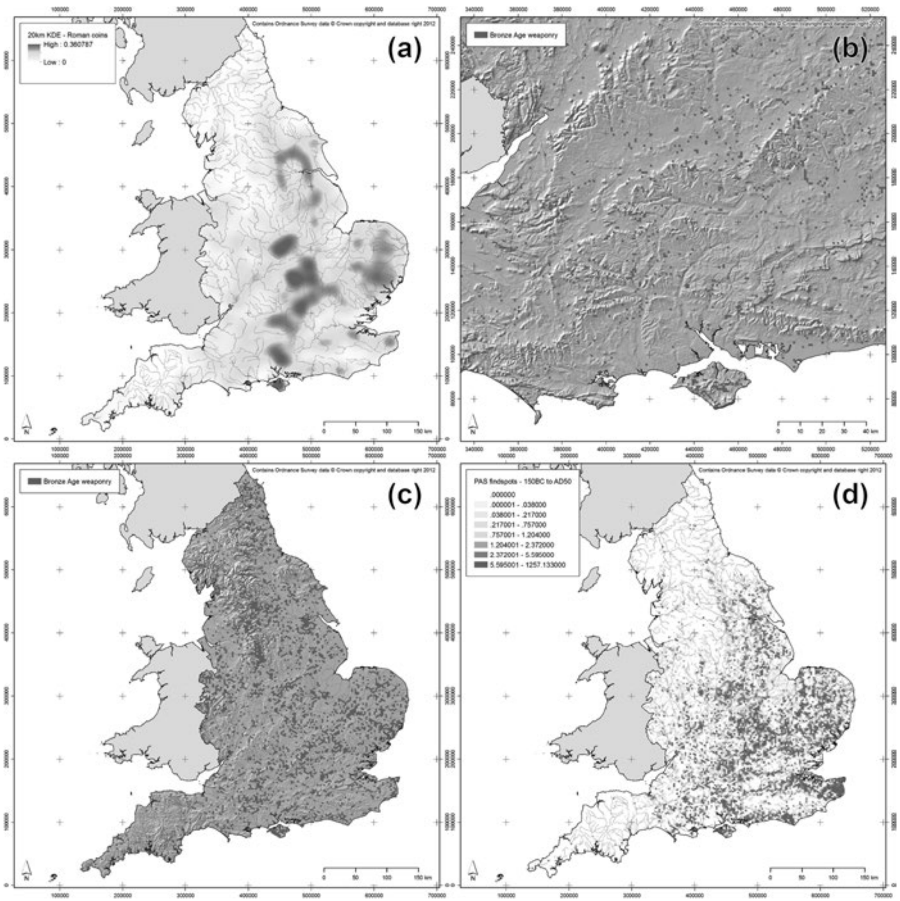
The useful part of this for our purposes here is the idea that the greater the precision one can discover about one aspect of a particle's state, the lesser the precision that one is able to discover about another (related) aspect of said particle's state. This appears to be a fundamental property of the universe that we exist within. Whilst I would not propose the existence of a Planck's constant for cartography, the idea that precision of measurement on one variable is related to precision of measurement in another variable can form a very useful metaphor for the untrained cartographer for estimating the level of detail that can be comprehensibly placed upon a map, with the "particle" being equivalent to any element placed on a map.[2]

Using the Uncertainty Principle to understand archaeological cartography

Time (usually as date or period), space (usually as place of discovery), and type (often as typological category) are fundamental to the nature of archaeological data. Time and type have been extensively theorised within archaeology, but space arguably less so, with most theoretical considerations of space in archaeology focusing on ontological questions (e.g. space as an a priori container) rather than epistemological ones. Key to the epistemological theorisation of space is spatial scale, with different past processes potentially discernable at different scales (Wheatley 2000: 123, 128; Lock & Molyneaux 2006b: 1; papers in Lock & Molyneaux 2006a, particularly Yarrow 2006).[3]

Spatial scale is one of the attributes of archaeological data that we can approach using map-production methods inspired by the Uncertainty Principle. For spatial scale, its linked attribute is spatial resolution: the size of the objects used on a map to represent the archaeological data, whether they be dots or spatial bins (see Green 2013 for more discussion on the latter). When working at broad scales, dots placed on a map will often cover many square kilometres of space and, as such, spatial precision matters less. As one moves in to narrower spatial scales, spatial precision becomes more important and the spatial resolution of the objects should become finer. To give examples from within the context of EngLaId (Figure 13.5a – b), at our broadest spatial scales (all of England as a small printed image) the most appropriate forms for mapping distributions would be interpolated surfaces, such as Kernel Density Estimates (KDE) (O’Sullivan & Unwin 2010: 68–71) or trend surfaces (O’Sullivan & Unwin 2010: 278–287), as these operate at coarse spatial resolutions where patterns remain visible that would be obscured or invisible if raw data was mapped (see Green *et al.* 2017). As our spatial scale narrows, we would move on to using various resolutions of aggregated spatial bins (Green 2013). Finally, at very narrow spatial scales, we would use the raw data directly exported from our database.

The second set of linked attributes of archaeological data that can be conceptualised using the Uncertainty Principle as a metaphor are time and type. Time in archaeology can be represented at a range of precisions from the complex probabilities of scientific dates (e.g. probabilities output from software like OxCal; Bronk Ramsey 1994) through to very coarse broad time periods (e.g. Iron Age, Bronze Age, etc.). Equally, type of object (whether a site, an artefact, an ecofact, etc.) can be represented at a range of categorical precisions from the broad (e.g. defensive monument) through to the more specific (e.g. bivallate hillfort, or conceptually even a single specific site). Clearly, as a database representation, it is possible to store and manipulate all of this detail for every record in a dataset. However, to attempt to represent the full complexity of our objects cartographically would be impossible (or, at least, incomprehensible). As such, these two attributes can again be



(a)
20km KDE - Roman coins
High : 0.360787
Low : 0
Contains Ordnance Survey data © Crown copyright and database right 2012
0 50 100 150 km
(b)
Bronze Age weaponry
0 10 20 30 40 km
(c)
Bronze Age weaponry
Contains Ordnance Survey data © Crown copyright and database right 2012
0 50 100 150 km
(d)
PAS findspots - 150BC to AD50
.000000
.000001 - .038000
.038001 - .217000
.217001 - .757000
.757001 - 1.204000
1.204001 - 2.372000
2.372001 - 5.595000
5.595001 - 1257.133000
Contains Ordnance Survey data © Crown copyright and database right 2012
0 50 100 150 km
N

Figure 13.5 Examples of maps from towards each extreme position; (a) broader scale, coarser resolution; (b) narrower scale, finer resolution; (c) coarser temporal precision, higher typological precision; (d) higher temporal precision, coarser typological precision

conceived as related within the bounds of the Uncertainty Principle: when making a map, the greater the temporal precision of mapped objects, the lesser the typological precision or complexity that should be applied. To give further examples from within the context of EngLaId (Figure 13.5c–d), if we were to map objects using precise temporal probabilities for time-slices, then only objects of a single type or of grouped types could be plotted on a map. Conversely, if we wished to create a map which showed the full gamut of site types in our database, then we could only map objects of a single time period (or all time periods grouped together). The latter case would still produce a map that was too complex to be understood by a reader, but the point is conceptually sound.

Bringing this all together (Figure 13.6), the two sets of related properties are also subject to a similar precision dependency. Broad spatial scale, coarse spatial resolution maps can only articulate relatively simple time/type relationships. Conversely, when working at narrower spatial scales and finer spatial resolutions, then more subtle time/type relationships can be more easily expressed. When working with this model in practice, an archaeological cartographer should begin by considering the research question which their proposed map is attempting to explore and who their anticipated audience is. Audience is key, as the complexity of a map can be at its greatest for internal analytical usage (as we can assume a researcher will be very familiar with their own data) and its lowest for public-facing usage (where we can assume no familiarity).

Assuming a large dataset, if the research question requires very precise time and type, then it can only be answered at relatively narrow spatial scales and, as such, the researcher should start at the top of the model (in Figure 13.6) and work down. Conversely, if the research question requires working at broad spatial scales, then the researcher should start at the bottom of the model and work upwards. As a brief example, if one wished to make a five by five centimetre map of grave goods dating to between AD 50 and AD 100 in England, the resulting map would be best done as a density surface (due to the small image size) and could only feature the broad category of all grave goods, or alternatively one specific subcategory. In this way, when making a map of archaeological data, even an inexperienced cartographer ought to be able to ascertain a sense of what level of time/type complexity and what spatial scale/resolution they should be working at, through their metaphorical understanding of the Uncertainty Principle.

Providing better context for distribution mapping

As something of an aside and to move away from quantum theory, another key element of increasing the reputation of distribution mapping in archaeological circles lies in improving the contextual information provided to our maps' audiences. It may be a cliché, but context is key to archaeological

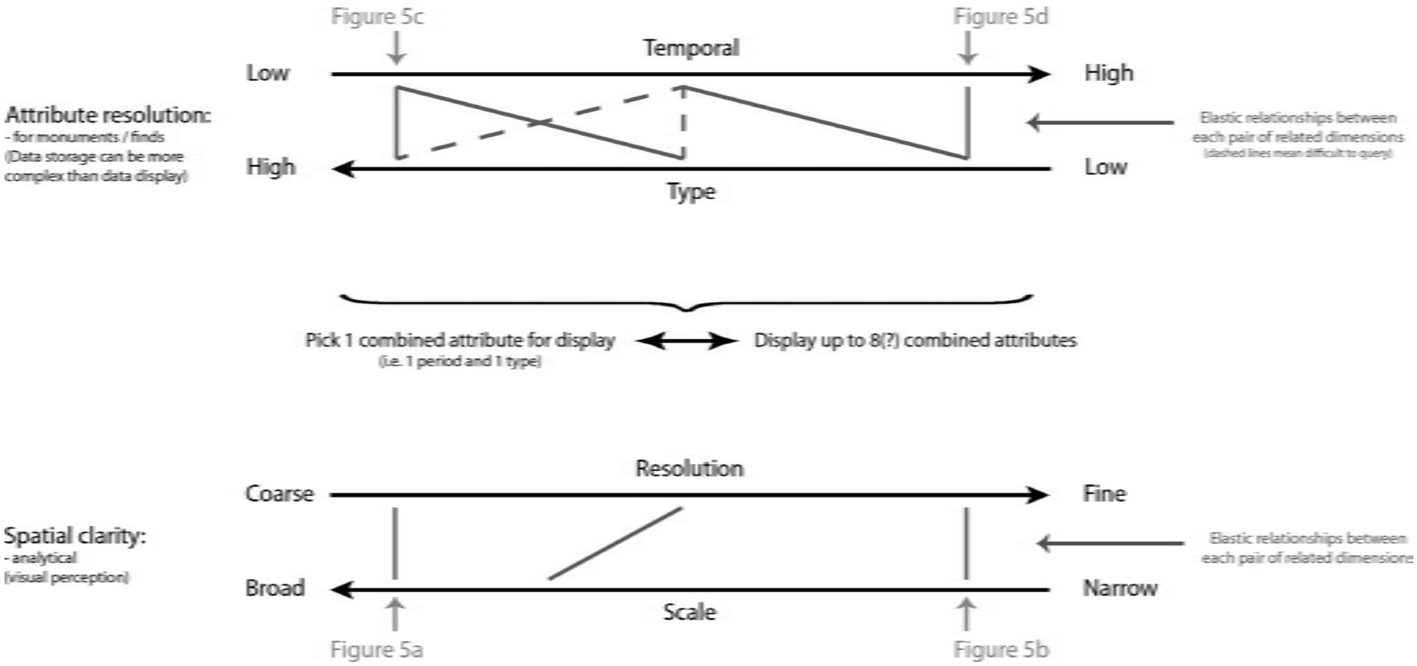


Figure 5c
Figure 5d
Temporal
Low
High
Attribute resolution:
- for monuments / finds
(Data storage can be more complex than data display)
High
Low
Type
Elastic relationships between each pair of related dimensions
(dashed lines mean difficult to query)
Pick 1 combined attribute for display
(i.e. 1 period and 1 type)
Display up to 8(?) combined attributes
Resolution
Coarse
Fine
Spatial clarity:
- analytical
(visual perception)
Broad
Narrow
Elastic relationships between each pair of related dimensione
Scale
Figure 5a
Figure 5b

Figure 13.6 Model depicting the application of the Uncertainty Principle to archaeological cartography

research, both on site and when zooming out to study broader areas of space. When mapping archaeological data regionally or nationally, it is important for cartographers to take account of the manner in which archaeological distributions are governed by patterns in fieldwork undertaken (Evans 2000: 3). This has become particularly important since the advent of developer funding of commercial archaeological fieldwork (in 1990 in Britain), as the location where the vast majority of investigations that take place since that time has been governed primarily by planning concerns rather than by archaeological research questions. This need not be conceived of as a problem to be corrected, but rather an element of the character of the data that should be studied and embraced (Cooper & Green 2016).

As such, it may be better to conceive of this relationship between fieldwork patterns and archaeological distributions using the concept of affordance. Introduced into archaeology via Ingold (1992), affordances are used within the discipline as a way of understanding the mutually constitutive relationship between people and their environment (Gillings 2007: 38–39). Essentially, the relationship between the archaeological record and patterns of development/fieldwork can be viewed in similar vein: practices in the modern world give rise to opportunities to analyse archaeological remains. Acquiring an understanding of this relationship is vital to understanding archaeological distributions today.

In order to enable quantitative analyses of this relationship, the EngLaId project constructed a model of modern affordances that have been affecting the structure of the archaeological record in England since 1990 (Figure 13.7) (for more on the structure of this model and the data built into it, see Green *et al.* 2017). This particular model reflects factors relating to excavation[4] and aerial photographic survey,[5] currently the two most common sources for information that has entered the English archaeological record (LiDAR and geophysical survey are still only just starting to result in significant numbers of new "sites" in England, being mostly employed to study sites that were already known). We can use the model to test distributions of archaeological sites in an attempt to assess the extent to which they are influenced by modern fieldwork patterns or by more genuine patterns of past practice.[6] Contextualising our data in this way is vital if we wish to make our distribution mapping work better at communicating and explaining any patterns that we might discover, as the distributions we map are mostly no longer primarily structured by past practice (if they ever were). Modern affordances are just one example of better contextualisation, but they are a particularly key one. In combination with a more structured understanding (as discussed above) of the relationships between scale, resolution, time, and type, improving the contextual elements of archaeological maps can only make their messages more powerful.

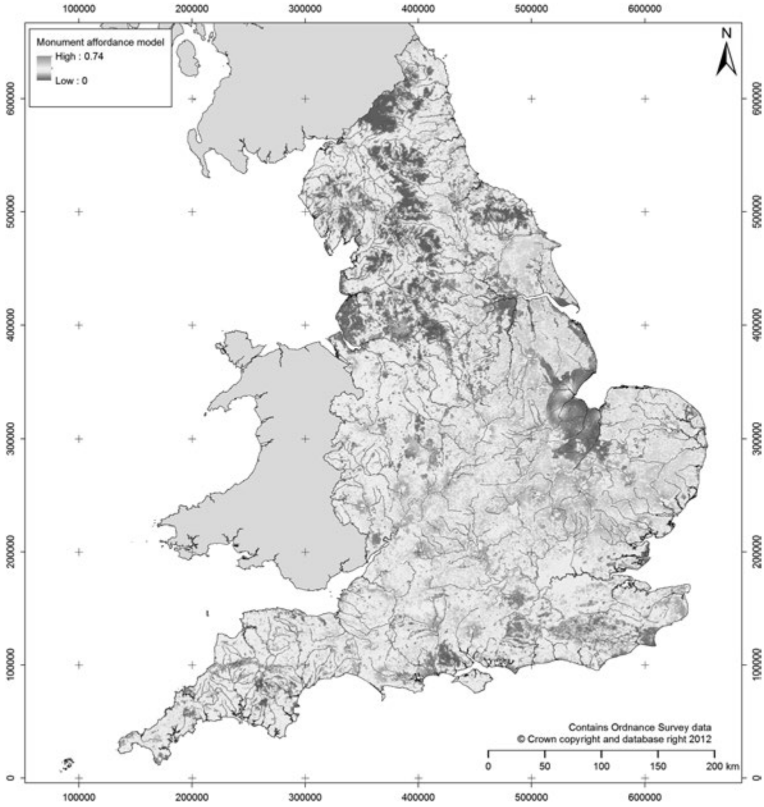

Monument affordance model
High : 0.74
Low : 0
N
Contains Ordnance Survey data
© Crown copyright and database right 2012
0
50
100
150
200 km
100000
200000
300000
400000
500000
600000
0

Figure 13.7 Model of modern affordances affecting the structure of archaeological distributions in England. This image contains modified data originally derived from: Historic England NRHE Excavation Index (hosted at: http://archaeologydataservice.ac.uk/archives/view/304/); Centre for Ecology & Hydrology's Land Cover Map 2007 (hosted at: http://doi.org/10.5285/2ab0b6d8-6558-46cf-9cf0-1e46b3587f13); NSRI National Soil Map of England and Wales (hosted at: www.landis.org.uk/data/natmap.cfm).

Conclusions: making better archaeological maps?

To return one final time to my autobiographical examples, since 2011 I have been employed on the EngLaId project as a postdoctoral researcher in GIS. As a result, I have spent many hours making many different maps of many different datasets. I have regularly made maps for my own purposes, for other project members, and for other people working within our department. As a result, my skills as a cartographer have improved immensely, to the extent that I often feel quite a strong sense of pride over the maps that I produce (e.g. Figure 13.8). Distilling that experience into a model of good

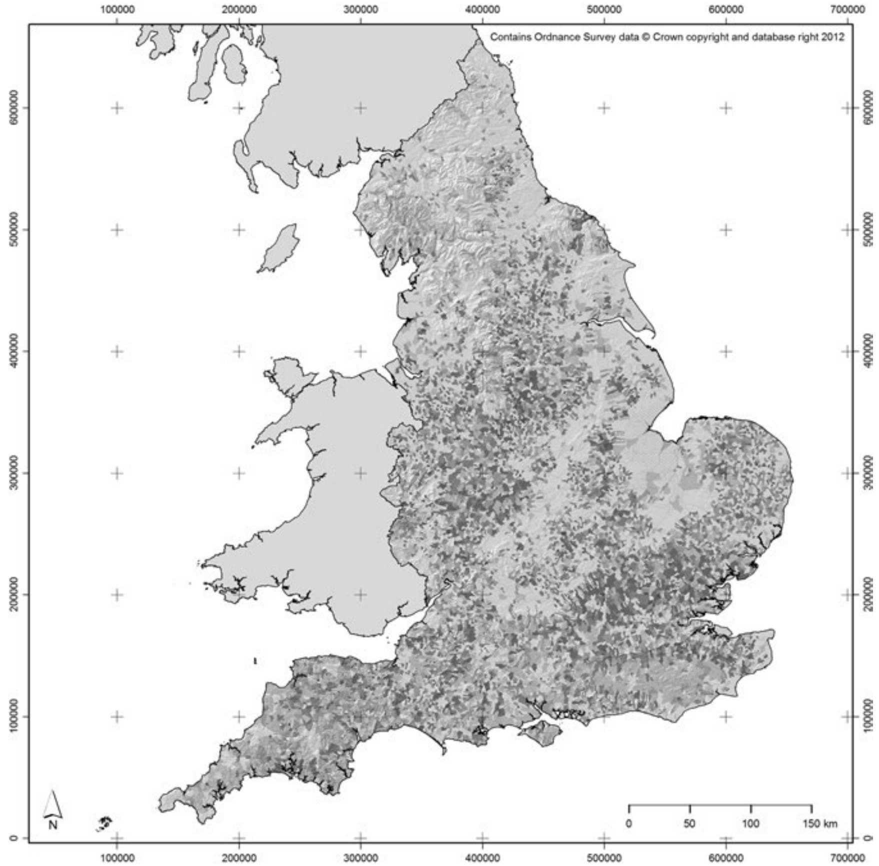

Contains Ordnance Survey data © Crown copyright and database right 2012
100000
200000
300000
400000
500000
600000
700000
0
N
0
50
100
150 km

Figure 13.8 Map created by the author in 2016. Darker green shading depicts greater levels of woodland cover in the eleventh century AD (after Roberts & Wrathmell 2000: figure 24), collated by post-medieval parishes (Burton et al. 2002). This image contains data derived from Sturt *et al.* 2013 (the former sea levels around The Wash).

cartographic practice for my own purposes and for the help of others has resulted in this paper.

Generally speaking, in my work I start with the question of scale and move upwards through the model outlined above, considering resolution next to maximise the legibility of the map produced. For example, although there are statistical methods for determining the appropriate kernel size for a KDE surface (e.g. the Mean Integrated Squared Error; Marron & Wand 1992), making a choice based upon cartographic legibility seems more logical to me as that should always be a key concern when making any map.

Visualization for the purposes of research (of which map making is but one strand amongst many) exists to save time during the processes of discovery and communication of information and knowledge (Chen *et al.* 2014), with "pleasantness" key to visual efficiency (Kent 2005: 184). As a specific technique, map design lies at the central point between art, science, and technology, with no single recipe for success (Field & Demaj 2012: 73–75). As such, cartographic concerns such as legibility (including taking account of colour blind audience members) and aesthetic appeal should be foremost in our minds when making maps. A metaphorical understanding of the Uncertainty Principle as outlined above can aid greatly in that task, providing guidance to aid the archaeological cartographer without dictating or attempting to control methods or outputs.

We make maps and use GIS in an attempt to make sense of the geographical world: they are as artistic and as political (Crampton 2010: 3, 12) as the world around us. They imperfectly reflect (or refract?) reality and should be embraced as such. Thus, we should not be anxious about cartography in and of itself, only anxious about approaching it uncritically (Crampton 2010: 184). Maps are no longer only useful for the increasingly moribund hypothesis testing/pattern confirmation practices of the old scientific method, but can be vital to modern exploratory data analysis/pattern seeking methodologies (Crampton & Krygier 2006: 24) as part of hybrid approaches to understanding the world/archaeology (Hacıgüzeller 2012: 257) through suggestion, not definition, of spatial patterning (Sturt 2006: 131).

Distribution mapping of archaeological material remains vital to the understanding and communication of the results of fieldwork and other investigations, giving a flavour of space and presenting an idea of the relationship between archaeological remains and local/regional topography (Sturt 2006: 131). Careful cartographic choices (e.g. using models such as that outlined above) and an understanding of context (including modern affordance patterns) are vital for achieving critical comprehension of our material in all of its wonderful character. Archaeologists are very rarely trained cartographers, though this should not be seen as a problem, but more as an opportunity. I hope that the ideas outlined in this chapter will help guide those wishing to make maps of archaeological data down fruitful avenues, whereby effective communication is enabled through an understanding of the vital inherent relationships between scale/resolution and time/type. Finally, I will leave it up the reader to decide if I have improved as a cartographer since I made my first maps in the late 1990s, but I am certain that my creation of the model presented here has aided in whatever improvement I have achieved.

Acknowledgements

This paper was written whilst working on the English Landscapes and Identities Project (EngLaId) at the University of Oxford. EngLaId has been funded by the European Research Council (Grant Number 269797). My thanks go to the other members of the EngLaId team for providing a stimulating research environment without which this work would not have come to fruition. In particular, the ideas presented in this paper arose out of fruitful discussions with Anwen Cooper on the capacities of our evidence and how we can present it to the world. I would also thank Anwen Cooper, Miranda Creswell, Victoria Donnelly, Michaela Ecker, Letty ten Harkel, and Sarah Mallet for helpful feedback on draft versions of this paper, as well as the editors of this volume for the further useful advice.

Notes

1 CIfA is a membership organisation which requires the provision of references and work samples to become an accredited member, and which involves members signing up to a code of conduct, etc. See: www.archaeologists.net/

2 Incidentally, knowledge of Heisenberg has previously been suggested as a desirable trait for archaeologists, albeit as a metaphor for greater archaeological understanding of the natural sciences rather than anything specifically to do with Heisenberg's work (Pollard 1995). One might also get a sense of the Uncertainty Principle in Olivier's Cycles of Memory (2011: 190–194) and certainly in his uncertainty principle of the archaeological past, in which he states that it is impossible to know both the position of any moment of the past in time (i.e. its date) and its rate of transformation (i.e. its place in evolutionary history) (Olivier 2001: 69).

3 The terms "large" and "small" are problematic when applied to spatial scale due to the differing conceptions of cartographers (who use "large" to mean a large representative fraction, e.g. 1:10,000, and "small" to mean a small representative fraction, e.g. 1:250,000) and most other people (who would expect a "large" scale analysis to cover a large amount of space, and vice versa) (Lock & Molyneaux 2006b: 5). As such, herein I will use the terms "narrow" to refer to spatial scales that cover smaller amounts of space in higher detail, and "broad" to refer to spatial scales that cover larger amounts of space at lower detail.

4 Planning data was impossible to collate, so excavation affordances were modeled using the density of previous excavations from 1990 to 2010, including excavations with negative results and those that found material of any time period (to minimize bias introduced by focusing on specific periods).

5 Factors affecting aerial photographic survey were modern land use (arable representing crop mark potential; pasture representing earthwork or parch mark potential) and obscuration of the ground surface, whether by above ground structures/water bodies/woodland or below ground masking superficial geologies/soil types.

6 For example, hillforts score low on this model, as they tend to be in areas where opportunities to find archaeological material are low but being large and obvious monuments they tend to be easy to discover despite that. A monument category like Anglo-Saxon sunken featured buildings (also known as *Grubenhäuser)* score much more highly on the model, as they are less obvious and, thus, require greater levels of opportunity to be discovered.

References

Bronk Ramsey, C. (1994). Analysis of chronological information and radiocarbon calibration: The program OxCal. *Archaeological Computing Newsletter*, 41, 11–16.

Burton, N., Westwood, J., & Carter, P. (2002). *GIS of the Ancient Parishes of England and Wales, 1500–1850* [dataset]. Colchester, Essex: UK Data Archive [distributor]. SN: 4828.

Chen, M., Floridi, L., & Borgo, R. (2014). What is visualization really for? *The Philosophy of Information Quality*, Springer Synthese Library, 358, 75–93.

Collins, K. (2013). Uncharted territory: Amateur cartographers fight to put their communities on the map. *Wired*. www.wired.co.uk/article/slum-mapping-google-maps-cartography. Accessed 31 January 2017.

Cooper, A., & Green, C. (2016). Embracing the complexities of 'Big Data' in archaeology: The case of the English Landscape and Identities Project. *Journal of Archaeological Method and Theory*, 23, 271–304.

Crampton, J.W. (2010). *Mapping: A Critical Introduction to Cartography and GIS*. Chichester: Wiley-Blackwell.

Crampton, J.W., & Krygier, J. (2006). An introduction to critical cartography. *ACME: An International E-Journal for Critical Geographies* 4(1), 11–33.

Dent, B., Torguson, J.S., & Hodler, T.W. (2009). *Cartography: Thematic Map Design*. New York: McGraw Hill.

Evans, C. (2000). Archaeological distributions: The problem of dots. In Kirby, T. & S. Oosthuizen (Eds.) *An Atlas of Cambridgeshire and Huntingdonshire History*. Cambridge: Centre for Regional Studies, Anglia Polytechnic University, 3–4.

Field, K. (2005). Maps still matter: Don't they? *Cartographic Journal* 42(2), 81–82.

Field, K. (2009). Cartographic twitterings. *Cartographic Journal* 46(2), 59–61.

Field, K. (2014). A cacophony of cartography. *Cartographic Journal* 51(1), 1–10.

Field, K. (2015). Re-freshing cartography. *Cartographic Journal* 52(2), 93–94.

Field, K., & Demaj, D. (2012). Reasserting design relevance in cartography: Some concepts. *Cartographic Journal* 49(1), 70–76.

Gartner, G. (2009). Web mapping 2.0. In Dodge, M., R. Kitchin, & C. Perkins (Eds.) *Rethinking Maps*. London & New York: Routledge, 68–82.

Gillings, M. (2007). The Ecsegfalva landscape: Affordance and inhabitation. In Whittle, A. (Ed.) *The Early Neolithic on the Great Hungarian Plain: Investigations of the Körös Culture Site of Ecsegfalva 23, County Békés*. Budapest: Publicationes Instituti Academiae Scientarium Hungaricae Budapestini, 31–46.

Green, C.T. (2011). *Winding Dali's Clock: The Construction of a Fuzzy Temporal-GIS for Archaeology*. BAR International Series 2234. Oxford: Archaeopress.

Green, C.T. (2013). Archaeology in broad strokes: Collating data for England from 1500 BC to AD 1086. In Chrysanthi, A., D. Wheatley, I. Romanowska, C. Papadopoulos, P. Murrieta-Flores, T. Sly, & G. Earl (Eds.) *Archaeology in the Digital Era: Papers from the 40th Annual Conference of Computer Applications and Quantitative Methods in Archaeology (CAA), Southampton, 26–29 March 2012*. Amsterdam: Amsterdam University Press, 307–312.

Green, C.T., Gosden, C., Cooper, A., Franconi, T., Ten Harkel, L., Kamash, Z., & Lowerre, A. (2017). Understanding the spatial patterning of English archaeology: Modelling mass data, 1500BC to AD1086. *Archaeological Journal* 174(1), 244–280.

Hacıgüzeller, P. (2012). GIS, critique, representation and beyond. *Journal of Social Archaeology* 12(2), 245–263.

Hawking, S. (2011). *A Brief History of Time: From the Big Bang to Black Holes*. London: Bantam.

Heisenberg, W. (1927). Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik. *Zeitschrift für Physik* 43(3–4), 172–198.

Ingold, T. (1992). Culture and the perception of the environment. In Croll, E. & D. Parkin (Eds.) *Bush Base, Forest Farm: Culture, Environment, and Development*. London: Routledge, 39–56.

Kent, A.J. (2005). Aesthetics: A lost cause in cartographic theory? *Cartographic Journal* 42(2), 182–188.

Lock, G., & Molyneaux, B.L. (Eds.) (2006a). *Confronting Scale in Archaeology: Issues of Theory and Practice*. New York: Springer.

Lock, G., & Molyneaux, B.L. (2006b). Introduction: Confronting scale. In Lock & Molyneaux 2006a, 1–11.

MacEachren, A.M. (1995). *How Maps Work: Representation, Visualization, and Design*. New York: Guildford Press.

Marron, J.S., & Wand, M.P. (1992). Exact Mean Integrated Squared Error. *The Annals of Statistics* 20(2), 712–736.

Monmonier, M. (1996). *How to Lie With Maps*. 2nd edition. Chicago: University of Chicago Press.

Olivier, L. (2001). Duration, memory and the nature of the archaeological record. In Karlsson, H. (Ed.) *It's about Time: The Concept of Time in Archaeology*. Göteborg: Bricoleur Press, 61–70.

Olivier, L. (2011). *The Dark Abyss of Time: Archaeology and Memory*. Lanham: AltaMira Press.

O'Sullivan, D., & Unwin, D. (2010). *Geographic Information Analysis*. 2nd edition. New Jersey: John Wiley & Sons.

Pollard, A.M. (1995). Why teach Heisenberg to archaeologists? *Antiquity* 69(263), 242–247.

Rivet, A.L.F., & Smith, C. (1979). *The Place-Names of Roman Britain*. London: Batsford.

Roberts, B.K., & Wrathmell, S. (2000). *An Atlas of Rural Settlement in England*. London: English Heritage.

Southworth, M., & Southworth, S. (1982). *Maps: An Illustrated Survey and Design Guide*. Boston: New York Graphic Society/Little Brown.

Sturt, F. (2006). Local knowledge is required: A rhythm analytical approach to the late Mesolithic and early Neolithic of the East Anglian Fenland, UK. *Journal of Maritime Archaeology* 1(2), 119–139.

Sturt, F., Garrow, D., & Bradley, S. (2013). New models of North West European Holocene palaeogeography and inundation. *Journal of Archaeological Science* 40(11), 3963–3976.

Tufte, E.R. (2001). *The Visual Display of Quantitative Information*. 2nd edition. Cheshire, CT: Graphics Press.

Wheatley, D. (2000). Spatial technology and archaeological theory revisited. In Lockyear, K., T.J.T. Sly, & V. Mihăilescu-Bîrliba (Eds.) *CAA96: Computer Applications and Quantitative Methods in Archaeology*. BAR International Series 845. Oxford: Archaeopress, 123–131.

Wood, D. (2003). Cartography is dead (thank God!). *Cartographic Perspectives* 45, 4–7.

Yarrow, T. (2006). Perspective matters: Traversing scale through archaeological practice. In Lock & Molyneaux 2006a, 77–88.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Part 5

When all is said and done

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

14 Making maps

A commentary

Monica L. Smith

Introduction

In *Exercices de style*, the mid-twentieth-century author Raymond Queneau tells a banal tale of a bus journey in 99 different ways. Some of the renderings are staccato, some are languid and verbose, and some are technical and detailed. The same sequence of events is told over and over again, with each rendition a stand-alone story that provides basic facts enveloped in a new robe of words. Narrated through a slightly different lens each time, the vignettes acquire a cumulative effect of diverse perspectives such that no one telling is more or less complete. The reader need not peruse more than one of the vignettes to know the essence of the story, yet there is a certain depth that results from reading one version after another.

Maps as visual renderings have the same capacity for multiple retellings, each with their own voice and authority. No two maps of a region are alike, because each one is graced with different tones, shades and elements that are emphasized or de-emphasized from one iteration to the next. Every generation demands new maps for itself, not only because the landscape changes but also because the ways of viewing the landscape change, because the questions asked of maps change, and because the viewers themselves change. Those expectations are facilitated and manipulated by the map-maker who becomes the interlocutor of perception and the arbiter of truth(s).

From the time of the very first maps, there were innumerable idiosyncratic flourishes that revealed the style and the skill of the cartographer in dialogue with a perceived audience. One of the earliest cartographic representations is from the Mesopotamian site of Nippur, drawn on a clay tablet 3,500 years ago. As do all maps, it leaves out more than it reveals, reducing an ancient city of thousands of occupants and millions of artifacts to a terse, evocative series of lines that convey what the map-maker thought important: the names of the gateways, the placement of the ship basin and canal, the location of a city garden (Maic 1976; Ur 2012). Even today, maps reveal an authorial style in everything from scale and extent to the shape of the North arrow, the icons of structures and features, and the different fonts allocated to natural or cultural elements.

In this volume, the authors have engaged with the philosophical and logistical aspects of mapmaking as a necessary interpretive component of archaeological research. Why are maps so powerful in their capacity to display and persuade? Having often been in places where people have limited literacy, I have been struck by the immediate familiarity of the bird's eye view as a convention for understanding landscapes, whether rendered on paper or accessed through a Google Earth image downloaded onto a phone. The ability to read maps, therefore, is something that seems ancestral to our cognitive process, but what about the process of *making* maps? The fact that maps are so often juxtaposed awkwardly into our written archaeological narratives indicates the extent to which there is a kind of cognitive dissonance in academia that does not seem to bother people on the street.

Maps as analysis

The summary power of maps is in their inherent capacity to visually demonstrate complex information. By now we have all understood and accepted the idea of "how to lie with maps" as famously noted by Mark Monmonier (1996) in his book of the same name. Archaeologists in particular recognize that our maps are doubly removed from lived reality: not only are we distilling what we see (sites, features and artifact locations) for representation on a piece of paper, but those ancient vestiges have themselves been distilled over time in ways that we cannot fully ascertain. Careful attention to site formation processes notwithstanding, our ability to make an archaeological map is conditioned by many factors beyond our perception and control.

The accretionary effect of human activities on the landscape means that the palimpsest of the past is cumulative and incremental, although those factors are difficult to capture on maps that are often meant to stand as a summary statement of broad time periods. In a landscape of earthworks and barrows and Roman towns such as one encounters in Europe, millennia of human activities are imposed or superimposed on prior vestiges. The cartographer is at license to pick and choose which themes to emphasize, but even modern maps provide a sense of the honored past that lies just below the surface: the Gallic remains under Notre Dame; the streetscapes of York in the museum basement; the burial of Richard III in the car park. Maps coyly reveal these hidden worlds as places that are buried under something else, encoded into the present by the archaeological cartographer who anchors the past to the modern world.

However, we also need to consider the ways that maps are evidentiary proof of things that have been made to disappear from the landscape. In many parts of the world, archaeological remains have been subsumed to modern developments, so that the physical map is the only record of the palimpsest of the past. Maps are a way of communicating the dark side of human nature too: concentration camps and internment camps and slave plantations that were once the dread-anchors of human activity but that exist now only in the imagination. Writing on the subject of maps and assemblages in this volume, Gavin Lucas and Oscar Aldred remind us (citing Ingold 2010) that a map is a representation as well as a tool. In creating an authoritative record of past realities, Dianne Scullin adds that we should also consider maps as witnesses.

Yet like all witnesses, maps are subordinate to the presence of an interlocutor, without whom they cannot release their power. In New York, the African Burial Ground was on maps made in the eighteenth century but the documents lay dormant for two hundred years until the cemetery was, by accident, materially substantiated by skeletal remains uncovered during construction (La Roche and Blakey 1997). Having been confronted by the unexpected, archaeologists scurried to the archives to be able to name their discovery and to contextualize its importance in the history of the city. Today we are still making maps of what we have erased, calling attention to historical phenomena that are no longer extant but whose ghosts are still with us. In Germany's reunited capital, maps show the location of the Berlin Wall as an intact perimeter even though the wall itself has been torn down and carted off variously to museums and trash dumps. In Patna, India, right near the crowded railway station, there is a new Buddha Park that has been made from the land that once housed the city jail. Acknowledging that the palimpsest of the past is rarely neutral, signs at the park note the collective hope that the former landscape of pain can now been transformed to a place of peace.

Through the deliberate hand of the cartographer, maps often convey history and human effort in ways that long lengths of text cannot. Prior to the visual persuasion of photography, maps were perhaps the most immediate and comprehensive form of documentation and communication. The modern world's engagement with maps became accelerated by the Peace of Westphalia in 1648, from which time boundaries became a matter of negotiation rather than warfare (Murphy 1996). The subsequent boom in cartography was borne of a landscape-scale appreciation of territory in which knowledge shortly became transformed into power, and thence into control. The intellectual nexus of mapping knowledge and political domination was particularly evident in colonized territories, where the process of knowing the landscape was hardly a neutral matter of information-gathering (as it might be for field-walkers fascinated by earthworks), but a fundamental component of nation-building. Mapmaking, which required education and expertise, not only provided an authoritative physical document of landscape conditions, but entitled the cartographer to a kind of intellectual ownership through phenomenological appropriation. George Washington, the first president of the United States, started his career as a surveyor and map-maker when he was only a teenager; Thomas Jefferson and Abraham Lincoln also worked as land surveyors and brought that perspective and expertise to executive office.

One could find fault with cartographers for their subsequent precision in delineating and dominating the world, but we need to recognize that one of the benefits of the mapping paradigm that we have inherited from the 17th and 18th centuries is the way in which the whole globe, and not just selected parts, were subjected to detailed scrutiny. Every landscape, from cities to the remotest forests, was covered at the same scale in atlases, providing the scope to look for things to place on those blank pages: for biologists, there were rivers and meadows; for geologists, there were scarps and fossiliferous deposits; and for archaeologists, there were traces of ancient human activity to plot. For those who seek archaeological discovery, there are still blank spaces awaiting the inscription of the past, including the near-shore underwater world (see, e.g. Bailey 2009) and the thawing high-altitude ranges of alpine foragers (see papers in SAA 2014).

Maps as representations

Maps as visual encapsulations are understood to be a shorthand for the real world that they represent. Prose can capture conversation and musings at a 1:1 scale and in intimate detail; indeed, prose sometimes is more fulsome than real conversation in revealing the thought-process of an author or the inner life of a protagonist. By contrast, a map is reductive in scale, and cannot – barring the impossibility of Borges's cartography (see Lucas and Aldred this volume) – possibly capture all of the subtleties of the real world. Despite the inevitable triage and abbreviation of the map-making process, maps are meant to both reveal and illuminate, a transformation made possible by the use of space-saving icons and other conventions of visual shorthand.

Maps of possession identify and outline the boundaries of territory, while maps of waypoints highlight that which is not to be missed in the perambulations of the countryside. In some cases, maps use interpretation and dotted lines to highlight subtle features that are all but invisible to the naked eye. In other cases, mapmaking results in some details being obscured rather than illuminated. Government agencies and other institutions often prescribe a *lack* of precision in order to protect sites from looting, resulting in a deliberate blurring of data or the use of other obfuscatory tactics in presentation (see Bevan 2012). But the desire to camouflage find-spots runs deeper than bureaucracy; as Silvia Tomášková observes in her paper about South African rock art in this volume, there are many reasons why archaeologists would deliberately omit cataloging that which is known to exist. In some cases, information may be hoarded to protect an investigator's as-yet unpublished intellectual property, but not all of the wariness is due to ego: in nations deeply scarred by apartheid, totalitarian regimes and repression, it is unwise to reveal too much.

Even when there is a desire to conceal, are some elements of the landscape too large to hide? Papers in this volume that evaluate the study of earthworks take it as a given that such features *should* be mapped and ask which is the right way to go about doing so. Landscapes all over the world are replete with monuments such as earthworks and megaliths that have always been there and require no excavation or uncovering. As immovable primordial phenomena, they are the oldest figures of the cartographic palimpsest. They could be handily removed from the map when necessary to convey something about the modern; yet those ancient structures are rarely effaced and hold a place of pride in mapmaking even when the ancient stones hold neither purpose nor meaning for the modern dweller.

Large and comprehensive data sets are inevitable in other ways. Michael Fradley's chapter works through the author's own experience with the topography of earthworks, and notes that the development of new techniques such as Light Detection and Ranging and unmanned aerial vehicle maps are already adding new types of data, and more information, than could ever be captured by field teams using pencil-and-paper maps. Yet, as Piraye Hacıgüzeller (this volume) also highlights, the social dynamic of knowledge production is quite different with digital cartographic practices than their paper-based counterpart. Considering remote-sensing methods, for instance, the map itself is made in a laboratory and not with the ground underfoot as in the case of a plane table, theodolite or total station. As Tessa Poller (this volume) shows, in the old-fashioned survey of earthworks there was a visible product at the end of each field day that was materialized through each pencil stroke; with digital mapping strategies, there are a variety of options exercised simultaneously. This should cause deep consternation and unease, because the resultant map is never "finished." Digital data 'clean-up' is an ongoing process, and iterations of maps can result in a kaleidoscope of outputs. In the pre-digital days, there was one map and one map only, and once the map was done, it was an authoritative document that served for a generation. Now a map may be obsolete in less than a day when some new iteration is demanded. Digital data storage is essential, yet little theorized and should figure more prominently in our assessment of what it means to map a site or a region.

Maps as escapism

People travel through both words and maps to envision places that they might visit in future, or might never visit at all. Caleb Lightfoot and Christopher Witmore engage with the ancient Greek writer Pausanias, whose descriptive *Periegesis Hellados* constituted the world's first guide-book. For Pausanias, the act of map-making was a verbal rather than a drawn one, but the process was one of distillation with an authoritative voice that directed the gaze of followers to "see" what was worth seeing. The combination of "exhibition and aesthetics" cited by Lightfoot and Witmore enabled Pausanias to be the arbiter of value for future generations of visitors who preconditioned their own discoveries through the lens of the guidebook (a traveler's dilemma that persists to this day for those who are concerned not to 'miss' the most important sights but thereby foreclose themselves to independent discovery).

Selective representation also allows for the omission of unpleasant or unwanted elements, but without any obvious responsibility or editorial statements. Just as photography's authorial gaze purposefully directs a viewer by cropping the unwanted (Shanks 1997), the cartographer's art displays only a subset of the world. Andrew Valdez-Tullett (this volume) characterizes the process as a "sanitized and simplified version of reality that is often mixed with more theoretical elements presented as fact." A map rarely owes anything obvious to prior incarnations: it does not have quotation marks, rarely has bibliographic citations, and is presented as a stand-alone incarnation. Even when copyright dictates the acknowledgement of a predecessor, there is only the cryptic notion that the current map is the "*n*th edition" without indication of what has been augmented or erased from versions prior.

A map, no less than any other form of text, is a way of making a world beyond merely describing it. Valdez-Tullett's paper additionally discusses the way in which the cartographer must decide how to render qualitative phenomena into quantitative icons: the difference between a "small pit" and a "large posthole" might be only a few centimeters, but the implied interpretations of those two phenomena are considerably different. Yet an experiential map of an ancient lived environment contains more than a roster of physical remains; in assembling features on a single page, there is an implied ancient holism that is more viscerally felt through image than through text. This factor of belief resonates in our own modern imaginary as well: only when Tatooine and Dagobah were invented could anyone make a map of them, and those first maps were definitive. As visitors, we could never question whether the depiction we were seeing was "right" or "real."

Maps provide real images of imaginary places from the foreign country that is the past, and map-makers signal this reality through many different types of sign-making, ranging from shading and font to abbreviations of iconography. Long before emoticons permeated our textual landscape, maps were made intelligible by diminutive pictographs that constituted representations of features that readers might seek out. For modern landscapes, this includes symbols for gas, food and lodging; for maps of ancient sites, we expect nearby tags for mines, quarries and rock art. Authors in this volume have vigorously defended the analytic utility of basic "dots on maps," because even at their most elemental the dots convey meaning through their size, color and placement. Those dots, interpreted through the map key that is prominently printed alongside the visual representation, requires the reader to mentally populate the map with real features. The reliance on the viewer as a partner in map-creation provides the scope for even more creative uses of the cartographer's art: the papers by Lightfoot and Witmore and by Scullin both mention soundscapes, for example, and future iterations of experiential spaces might include temperatures, light, wind currents, or fragrances associated with different landscape activities (cf. Aletta and Xiao 2018).

You are here: maps as autobiography

The process of making a map involves a tangible and often emotional engagement with the landscape. Objectively, there is always a gap between the cartographer's perception and the reality of the ancient past; phenomenology, however earnest, has its limits. Yet while we might be thus unqualified to channel the past through the present, we have another, perfectly legitimate, affective claim: the channeling of the present through the past. Many of the papers in this volume either hint at or fiercely proclaim the ways in which archaeologists feel passionate about their work, and all of the papers take it as a given that participant-observation is an essential aspect of the map-making process: field archaeology is distinct from the armchair variety precisely because of the physicality of the outdoors. Even amongst field archaeologists there are further philosophical distinctions: excavators by definition stay in one place and can be sheltered by awnings, but the surveyor – whether the field-walker who searches for artifacts and features, or the cartographer making note of the same – is confronted by the brute force of sun and wind and rain. Small wonder, then, that Wickstead's paper refers to survey as a "pilgrimage," with the anticipation, hardships and depth of emotion that can accompany the enterprise of discovery and distillation.

Christopher Green's paper reveals that just as a writer's style is augmented and modified over time, a cartographer's style is the result of an individualized, maturing 'voice.' One tends to think of maps as 'unauthored' and anonymous, but the mapmaker's art/ifice is central to visual representation: a cartographer's portfolio can be as revelatory as an author's journal. Making the comment that "no map can ever be perfected to the taste of all audiences," Green reveals the necessity of acknowledging style as a literal framing device for the information encapsulated in a map. To this perception of movement over the landscape, Daniel Lee provides first-hand insights on why maps are inherently subjective: they are the materialized result of an intensely agentive process of walking over a site, or at least skirting it by some other means (Lightfoot and Witmore note that Pausanias used a ship's-deck perspective; Lucas and Aldred remind us of O.G.S. Crawford's pioneering aerial surveys). To the material process of movement, Lee adds the social context of reconnaissance, reminding us that "map" is a verb as much as it is a noun.

Collective autobiography is also addressed by Poller. Her chapter, like many of the others, contains something of a lament about the "old-fashioned" surveys that reveled in the grandeur of the ancient built environment and that resulted in dramatic conventions of hachure-planning that were highly interpretive compared to the sterile interval lines generated by topographic maps. Reading one of the older maps of Strathearn Fort or Maiden Castle, one encounters a cartography that combines military precision with an Art-Deco fanning that is no longer in fashion today but is still readable. Poller is frank about the mapping process including the legitimacy of having a "feel" of a place that entitles the cartographer to highlight what is otherwise invisible. The author's ethnographic approach, complete with videotaping of the mapping process, illustrates that the 'craft' of archaeology (*sensu* Shanks and McGuire 1996) is the result of a recursive process of seeing, doing and discussing, a point also raised by Hacıgüzeller in the discussion of multiple mapping strategies at Çatalhöyük and by Scullin in her chapter on acoustic mapping. Their discussions illustrate how the creation of a map is only one of the outcomes of fieldwork and includes the social realms in which archaeology is ensconced: the pub, and not just the publication.

The process of autobiography is not limited to the makers of maps but is an element of reading and using maps as well; as Lucas and Aldred (this volume) remind us, "a map is a construction by the labours of the people who make it and use it." We say that we are "studying" a map when trying to understand where we are in the world, because merely "looking" at a map seems insufficient to convey the level of intensive interaction that characterizes the process. And, where does one start? Unlike a text which is meant to be read in a linear fashion, a map can be read from any point. Nor is it possible to absorb everything about a map because there are always some elements that the mapmaker has included that are not germane to our purposes, or that serve us only tangentially: if we are on foot, a highway is of no use except as a point of reference; if we are driving, a bus stop has value in a different way than if we were on foot seeking both transportation and shelter from the rain. If we are searching for earthworks, the presence of a farmhouse on a map is at once a helpful point of reference and a visual irritant to the ancient landscape whose aesthetic we want to absorb.

In many cases, items on a map might be noted as the opposite of lacunae: things that are present that we wish were not there. But this need not be a limitation. Empowering in their versatility, maps can enable us to engage in "play" in the sense of imagination and forecasting and the ability to point towards a destination while discounting what we do not wish to see. Although some of the authors in this volume suggest that this realm of participatory engagement has been brought into being by the advent of digital media, mapmaking has always been a multivocal process: anyone could be a Pausanias, sketching out a map through lines or words to show something about the surrounding world or to indicate the direction of a passer-by's quest. Software simply makes the age-old human process faster and allows more iterations, and although some might lament that we are now being directed on simplistic point-to-point journeys by web interfaces that allow us to specify the beginnings and ends of our trajectory, the fact is that mapping software now lets us be emboldened to go beyond the familiar in the quest of the desired. That sentiment rings true to the very earliest cartographic depiction, making us kindred spirits with the people who made and used the map of Nippur.

References

Aletta, F., & J. Xiao (Eds.) (2018). *Handbook of Research on Perception-Driven Approaches to Urban Assessment and Design*. Hershey, PA: IGI Global.

Bailey, G. (2009). The Red Sea, coastal landscapes, and hominin dispersals. In M.D. Petraglia & J.I. Rose (Eds.) *The evolution of human populations in Arabia: Paleoenvironments, prehistory and genetics* (pp. 15–37). Netherlands: Springer.

Bevan, A.H. (2012). Value, authority and the open society: Some implications for digital and online archaeology. In C. Bonacchi (Ed.) *Archaeology and digital communication: Towards strategies of public engagement* (pp. 1–14). London: Archetype.

Ingold, T. (2010). Ways of mind-walking: Reading, writing, painting. *Visual Studies* 25(1):15–23.

La Roche, C.J., & Blakey, M.L. (1997). Seizing intellectual power: The dialogue at the New York African Burial Ground. *Historical Archaeology* 31(3):84–106.

Maic, F.V. (1976). The map of Nippur. *Cartography* 9(3):168–174. doi:10.1080/00690805.1976.10437902

Monmonier, M. (1996). *How to lie with maps*. Chicago: University of Chicago.

Murphy, A.B. (1996). The sovereign state system as political-territorial ideal: Historical and contemporary considerations. In T.J. Biersteker & C. Weber (Eds.) *State sovereignty as social construct* (pp. 81–120). Cambridge: Cambridge University Press.

SAA (Society for American Archaeology) (2014). Mountain and high altitude archaeology. *SAA Archaeological Record* 14(3):32–42.

Shanks, M. (1997). Photography and archaeology. In B.L. Molyneaux (Ed.) *The cultural life of images: Visual representation in archaeology* (pp. 73–107). London: Routledge.

Shanks, M., & McGuire, R.H. (1996). The craft of archaeology. *American Antiquity* 61(1):75–88.

Ur, J. (2012). Southern Mesopotamia. In D.T. Potts (Ed.) *A Companion to the archaeology of the ancient near East* (pp. 533–555). Malden, MA: Blackwell.

Taylor & Francis
Taylor & Francis Group
http://taylorandfrancis.com

Index

Note: *Italic* page references indicate figures and the "P" prefix refers to pages within the photo essay of Chapter 9.

3D models 109–112, *110*, *111*, 136–137, 148, 276–277

acoustic mapping: archaeoacoustics and 233; arguments supported by 252–254, *255*, 256–257; of Chavín de Huántar site 234; ephemeral phenomena and 254, 259; function of 233; with Geographical Information Systems 234; Hermion/Ermioni description and mapping project and P10; of Horseshoe Canyon rock art and echo effects 233; importance of 233; inquiry and, opening up varied avenues of 256; intensity of sound and 231, *232*, 235; mapping arguments and 236–242; methods 233–236; of mining landscape in West Penwith, Cornwall 234; objectification and 257–259; overview 231; pink noise and 234–235; process 239–240; sound presentation and 256–257; Sounds of Stonehenge Project and 234; translation of sound to image and 239; *see also* Huacas de Moche case study
active mapping 159
actor-network theory (ANT) 20, 240
aerial archaeology 84
aerial photography 99, 210–211, *211*
aesthetics, cartographic 2
African Burial Ground 305
Aldred, Oscar 305, 310
analysis, maps as 304–306
analytical earthwork survey 102, 105–109, *108*
Anthropological Survey of the British Isles (Peake) 57
antiquarianism 207
antiquities of the Bronze Age 53, *54–55*
antiquities, mapping 82–83
anxieties, cartographic 19–20, 30–31
archaeoacoustics 233
archaeologist in residence, concept of 156
archaeology: aerial 84; artefacts and 190; Behavioural 150; blank spaces in, remaining 306; Contemporary 143, 153; as craft 121; critical mapping in 1–3; cultural information and, gathering 75; debate in, current 7; disciplinary critiques and 1–3; disciplinary formation of 38; distribution maps problem in, perceived 281–284; dualistic camp of 203–204; enquiry methods 154; event-oriented 154–155, 169; excavation and 102–104; Experimental 150, 155–156; experimental mapping and 147–149, 150–152; experimentation in 144, 150–152; feminism and 75–79; feminist geography and 75, 77–80; field 53, 100–103, *101*, 106, 147; gender and 75–79; Geographical Information Systems in 2, 84–86; geography and 37, 77–78; grid system and 58, 147–149, *148*; Hermion/Ermiioni description and mapping project and P26; imagination in 226; Interpretive 150; knowledge about past and 9; landscape 27–30; maps in,

prominence of 1, 137; metaphors 155; moral geographies and 37; movements associated with 25, 26, 27; New 103, 147; non-representational perspective and 271; objectivity in, inconsistent attempts to attain 100; phenomenological 19; Post-processual 150; professionalization of 38; progress of 268–271, 277–278; reflexive approach to 119–120; re-politicising practice and 155; standardisation in 272; storytelling and 203; thick maps and 8–9; time in 289, 291; type of object in 289, 291; women and 75–77
Archaeology of the Cambridge Region (Fox) 53, 58
archaeo-topological survey: analysis of 112–114; analytical earthwork survey and 102, 105–109, *108*; archaeological site and, understanding 97–98; background information 97–100; defining 97; field archaeology and 100–103, 106; in future 109–112, *110*, *111*; ground-truthing and 107; hachure plans 100, *101*, 105, 118, *118*, 127; landforms and 98–99, *98*; Light Detection and Ranging data and 99, 107, 113; objectivity and 103–107; overview 113; subjectivity and 107, *108*, 113; surveyor's role and 112; 3D model and 110–112, *110*, *111*; trend in, declining 99–100, 103; unmanned airborne vehicles and 112–113; *see also* earthwork survey
Art/Archaeology projects 169; *see also* Map Orkney Month project
artefacts 190
Arts and Crafts movement 120
Ascher, Robert 211–212
assemblage of materials and practices, maps as: anxieties and 19–20, 30–31; hyper-reality of maps and 20–22, *21*; maps as media and 27–32, *29*; maps as tools and 23–25, *26*, 27, 37; possibilities of maps and 31–32
Aston, M. 29
autobiography, maps as 308–310
AutoCAD 158
Avebury map *48*
Awan, Nishat 208, 218
Baden Powell's Scouts 62
Bailey, Doug 151
Baker, Rowena *166*
Bakhtin, M.M. 207
Bak Vehammaren carved panels 19
Band, Lara 167
Barad, Karen 207
Barker, Philip 103–104, 110
Bates, Martin 218–221, *220*
Baudrillard, J. 20
Beck, Harry 5
Behavioural Archaeology 150
belle noiseuses P25
Bennett, Jane 154
Berry, J.K. 185
Biancifiori, Elisa 274, 276–277
Big Datasets 8–9
Binford, L. 21
Birkeland, Tonje 160
Bisti P7, P16–P17
Bocage, Jean-Denis Barbié du P12–P13
Bodmin Moor 19, 151
Bonde, Sheila 241–242
Borges cartography P18, 20, 306
Borth site 218–224, *219*
Bory de Saint-Vincent, Jean Baptiste Geneviève P13
Bowden, M. 100, 105
Boxford circle 44–46
Bradley, Richard 7, 134
Branford, Victor 43, 59–60, 62
Bridge, The 213–218, *217*
Britain and the British Seas (Mackinder) 51
British Grid Systems 58
Buddha Park (India) 305

Cad Goddeu/The Battle of the Trees 219–220
Cambridge study (Fox) 22–23, *29*
Cardigan Bay map 222, *222*
Carta Marina map 185
Cartesian maps and practices 2, 11, 23, 28, 30–32, 143, 147, 158, 168, 184, 192, 197, 275, 284
cartography *see* mapping; maps
Carver, M. 104–105
Çatalhöyük (Turkey) case study: background information 267–268, 272; conclusions about 277–278; digital maps and 272–273, 276–277; heterogeneity of methods and 271–273, 277; homogeneity of

methods and 277; interpretation process and 120; mapping and 271–278; non-representational perspective and 271; overview 268; paper mapping 273–275; progress of archaeology and 268–271, 277–278; promise of digital cartography and 268–270; tablet PC mapping 275–276; team 274, 276–277; 3D model mapping 276–277
Caus Castle site 109–110, *110*, *111*, 113
Chartered Institute for Archaeologists (CIfA) 285
Chavín de Huántar site 234
Chthonia P2–P3
Circle tube line map 190, *191*
circular walk case study 145–147, *145*, *146*
citizen-geographers 47, 59–63
Clark, A. 24–25
Clayton, Daniel 61
Close, Sir Charles 58
Coddington, K. 77
cognitive mapping 2
Colby, Thomas 83
collaborative mapping 156–158, *157*, *158*, 162
collective autobiography 309
Collins, Patricia Hill 80
Coll, Rachel 88
Colvert, Brendan *157*, 165
Common Ground 5
communication model of mapping 236
communications theory and process 178–180, 184
Conkey, M. W. 80
Contemporary Arachaeology 143, 153
Cook, Mark *167*
Cooper, J.P. 5
Corner, James 257–258
Corridors of Time series 43
craft, concept of 120–121, 136
craft of earthwork survey 120–121, 136; *see also* earthwork survey; Ogle Hill survey
craft of fieldwork 122; *see also* Ogle Hill survey
craft traditions 7
Crampton, Jeremy 254, 284
Crawford, O.G.S. 20–23, *21*, 28, 37–38, 43–44, 58–59, 61–63, 82–84
Crigie, Alan 165
critical mapping 1–3, P11
Culham, Julien 220
Cult of Kata 38, 44–47, *47*, *48*, 62–63
cultural geography 152–153
cyberspace 215
cyborg-ontology 4

Danebury Environs programme 192, 194, *194*, *195*, *196*
Daston, L. 241–242
Davies-Culham, Sharon 220
Dawkins, William Boyd 52
Deed System 62
deep maps: antiquarianism and 207; conventional maps versus 226; defining 4, 207; in digital era 9; digital technologies and 8–9; elements of, basic 225; engagement with 225; historical perspective 207; instability of 226; layers and 218–224, *222*, *223*; multimedia developments and 5; present in 226; psychogeography and 224; richness of 225; size of 225; speed of 225; tenets 225–226; transmediality and 215–216, 225; unifying role of 225; *see also* geomythological deep maps
Deleuze, G. 86, 154
democratisation of mapping 269
Denman, Lynne 219, *219*
Descartes, René 11–12
differential Global Positioning System (dGPS) 126–127
digital data clean-up, ongoing process of 307
digital maps 2–3, 113–114, P15–P19, 268–270, 272–273, 276–277, 310; *see also* Çatalhöyük (Turkey) case study
digital technologies 5, 8–9, 136; *see also specific type*
Diller, A. P5–P6
distribution mapping: antiquities of the Bronze Age 53, *54–55*; background information 37–38; context for, providing better 291, 293; Crawford and 37–38, 44; criticism of 284; Cult of Kata and 38, 44–47, *47*, *48*, 63; Fleure and 37–44, *39*, 45; geographer-citizens and 47, 59–63; importance of 296; networks of sociality and knowledge and 38–44, *39*, 63; Ordnance Survey maps and 53, 55, 57–58; overview 38; Peake

and 37–38, 42–43, 45, *57*; politics of 59–63; pottery creating 189–190, *189*; problem in archaeology and, perceived 281–284; of racial characteristics 39, *39*; regional geography and 48–53, *52*, *54–55*, 55, *56*, *57–59*; roads 46–47, *47*, *48*; Roman Oxfordshire pottery 7, *29*; utopic ideas of Peake and 60–61
Dixon, James 167
Dodge, M. 236, 240–242, 256
Dorset cursus 19
double-map metaphor 20–21

earthwork, defining 97
earthwork survey: accountability and 120, 132, 135–136; adapting craft of 133–134; analytical 102, 105–109, *108*; Barker and 103–104; concept of 97; confusion about term and 98; craft and 120–121, 136; defining 97; difference in methodology of United Kingdom and rest of world 103; digital technologies and 136; 'distant gaze' of 108–109; engaging with information and 133; future of 136–137; hachure plan 100, *101*, 105, 118, *118*, 127; historical perspective 117–119; integrated strategy and 106–107; knowledge and 120; from measurement to interpretation 119–120; parts of 119; physical act of drawing and 119; possibilities of craft of, future 134–137, *135*; as powerful tool 109; reflexive approach to archaeology and 119–120; skill and 120; 3D models and 109–112, *110*, *111*, 136–137; trend in, declining 99–100, 103; understanding 131–133; *see also* archaeo-topological survey; Ogle Hill survey
editio princeps P5
Edney, Matthew 74, 268
Elwood, S. 86
encoding process 179–180
EngLaId database 281, 289, 293, *294*
'English Village' (Peake) 60
environmental determinism 49–51
ephemeral phenomena 254, 259
epidemiological map of cholera in London 285
epistemological myth 178
escapism, maps as 307–308
EuroGeographics P14
Evans, Emyr Estyn 42
event-oriented archaeology 154–155, 169
Eve, S. 136
excavation 102–104, 188
Experimental Arachaeology 150, 155–156
Experimental Geography 144, 153–154
Experimental Geography 152–153
experimental mapping: archaeology and 147–149, 150–152; background information 143–144; challenge of 169; circular walk case study and 145–147, *145*, *146*; cultural geography and 152–153; Leskernick team and 150–151; mapping and 147–149, *148*; overview 143, 168–169; Papay mappings 156–162, *157*, *161*; present archaeologies and 154–156; provocations for archaeological mappings and 169–170; *see also* Map Orkney Month project case study

facts 203
Faraklas, N. P7
Fawcett, C.B. 50
Fels, J. 238, 241
feminism and feminist theory 75–79
feminist geography: archaeology and 75, 77–80; background information 73–74; differences of 76, 88–89; feminism and 75–79; feminists in field and 87–88; gender and 75–79; map-making and 81–82; military methods as archaeological guides and 82–86; overview 74; space and, performing 81–82; success of 77; women and 75–77
fiction 203
field archaeology 53, 100–103, *101*, 106, 147
Field, K. 285
Flaws, Maureen 165
Fleming, A. 29
Fleure, Herbert John 37–44, *39*, 51–52, 61–63
Forde, Cyril Daryll 42
Foucault, Michel 226
Fowler, C. 5
Fox, C. 22–23, 28, 30, 53, 58–59
Fradley, Michael 307
Frog King 157

Galison, P. 241–242
Garman, Ian 165
Geddes, Patrick 43, 49, *59–62*
Gee, Chris 165
Geller, Pamela 78
Gell, Sir William P7
gender and gender theory 75–79
Genette, Gerald 215
genre de vie concept 50
Geodetic Mission P14
geographer-citizens 47, 59–63
Geographical Information Systems (GIS) 2, 84–86, 102, 158, 181, 234, 281, *282*, 285, 296
geography: archaeology and 37, 77–78; cultural 152–153; Experimental 144, 153–154; experimentation in 152–153; Graphic Information Systems and 2; humanist education and 61; modern archaeology and 37; neogeography and P17; networks of sociality and knowledge and 40; prehistoric 52–53; regional 5, 48–53, *52*, *54–55*, *56*, *57–59*; reinvention of 48; systemic 49–50; Vidalian 50; *see also* feminist geography
geomythological deep maps: Afghan woman drawing her passage 208, *209*, 210; Ascher and 211–212; background information 201–203, *202*; Borth site and 218–224, *219*; Bridge and, The 213–218, *217*; facts and 203; fiction and 203; geomythology and 204, 217–218, *217*; Keysar and 209–211; layers and 218–224, *222*, *223*; mythology and 204, 206, *205*, *206*; narration and 204; new understandings and, provoking 216; overview 224–226; reality and 205; stories and 203; storytelling and 203–205, *205*, 212, 214, 216; Syrian man drawing his journey 208, *209*; Tan-y-Bwlch site and 218–224, *220*, *221*; tenets 224–226; terms 203; theory 203–213; transmediality and 215–216, 225
geomythology 204, 217–218, *217*
Gillings, M. 85–86
GIS Certification Institute (USA) 285
Global Positioning Systems (GPS) 126–127, 147, 158, 182
god-trick of seeing everything 27, 239
Google Earth P16, P21, P23, 285
Google Maps P14, P16–P17, P21
Graves-Brown, P. 154
Green, Christopher 309
Green Roads of England, The (Hippisley-Cox) 46–47, *48*
grid system 58, 147–149, *148*
Grimaldi map P24
Grimani, Francesco P11
Grimes, William 62
ground surveys 99
Ground Truth 107, P17
Guattari, F. 154

hachure plans 100, *101*, 105, 118, *118*, 127
Hacigüzeller, Piraye 86, 307, 309–310
Haddow, Scott 274–275
Halliday, S. 120, 133
Haraway, Donna 237, 239
Harley, J.B. 31, 178, 238
Harmon, Katherine 8, 155
Harris, L. 237–238
Harrison, Rodney 155, 156
Hartl, Heinrich P14
Haverfield, Francis *59*
Hawking, Stephen 288
Hayes, Maria 219–220, 221, *221*
Hazen, H. 237–238
heartland theory 51
Hebrew University aerial photograph *211*
Hegmon, M. 79
Heidegger, M. P9, P19, 183
Heisenberg, W. 288
Herbertson, A.J. 42, 51, *59*
Hereford Mappe Mundi 185
Hermion/Ermioni description and mapping project: accretion and P24; acoustic mapping P10; aims of P1; archaeology and P26; *belles noiseuses* and P25; betrayal of scenography and P21; change and P23; closing note P26; critical map qualities and P11; digital maps and P15–P19; eighteenth-century maps of P12; engaging with information and P1; fungibility and P15; history P26; intensities of maps of P12; as invitation to view P26; mashup of satellite imagery and P20; multiplication of maps and P11; neutral background and P20; percolation and P24; in present times P7, P22; scales and, reshuffling P15; sea and P25; topology P24; video and acoustic ribbon and P10; weather and P21; *see also Periegesis*

Hippisley-Cox, Robert 46
Historic Landscape Characterization 234
Hodder, Ian 119–120, 270
Hodgson, Janet 4
Holzminden Prison Camp 37, *58*
Horseshoe Canyon rock art and echo effects 233
Hoskins, W.G. 20–22, 28, 30
Hou Je Bek, Wilfried 8
Houston, Stephen 241–242
Howard, P. 105, 132
Huaca de la Luna Plaza 1 *232*, 245, 248–249, *249*, *250*, 251, *255*
Huaca del Sol 244–245, *244*, *247*
Huacas de Moche case study: analysis 251–252; arguments supported by 252–254, *255*, 256–257; data collection 234; decibel level ranges and 245, *248*; Huaca de la Luna Plaza 1 *232*, 245, 248–249, *249*, *250*, 251, *255*; Huaca del Sol 244–245, *246*, *247*; mapping methods 234–236; overview 233, 242–244, *243*; sounds at site, current 238
'Human Regions' (Fleure) *51*, *52*
Hutchins, E. 24–25
hyper-reality of maps 20–22, *21*

Ibrus, Indrel 214–215
Ideas of Landscape (Johnson) 105
imagination 167, 226, 310
'immutable mobiles' 240
In Comes I 4
Independent Social Research Foundation (ISRF) 209
Indiana Jones franchise 214
Ingold, Tim 24, 133, 155, 216, 293
Inkster, Jo *164*
Inquisition, The, storytelling 205, *205*
internationalism 61
International Map of the Roman Empire 61
interpretation 132
Interpretive Archaeology 150
intersectional approach 80
Introduction to Field Archaeology (Williams-Freeman) 46, *47*

Jameson, Michael P7
James, T.C. 38–39
Jefferson, Thomas 305
Jenkins, Henry 215
Johansson, Erik 274
Johnson, Diarmuid 219–220, 222
Johnson, M. 21, 103, 105, 108

Kataric Circle 45–46
Kavanagh, Erin 220–221, 222
Kernal Density Estimates (KDE) 289, *295*
Keysar, Hagit 208, 209–211
Kinder, Marsha 214–215
'King of the Sea Trees' 221
Kitchin, R. 236, 240–242, 256
Kraak, Menno-Jan 256
Kropotkin, Pyotr 61
Krygier, J. 237

Ladle Hill map 185, *187*
landforms 98–99, *98*
landscape: archaeology 27–30; authorisation of 147; Cartesian method of quantifying 147; formation processes associated with 21; history 28–29; as material text 20–21; as meaningful text 20; monuments in 107, 112, 117, 125–127, 131–133, 136–137, 196, 306–307; studies 19
Landscape Survey Group 103
Last, A. 153
Latour, Bruno 20, 86, 240, 258
Law, John 273–274
Leake, Martin P12
Lee, Daniel 5, 156, 309
Lefebvre, Henri 153, 181, 184
Leicester map 185, *186*
Leidsche Rijin 8
Leskernick team 150–151
Lévy, Pierre 215
Ley, David 269
Liden, Signe 157
light bulb as medium 27
Light Detection and Ranging (LiDAR) data 99, 107, 113, 137, 307
Lightfoot, Caleb 306–308
Lincoln, Abraham 305
'Line Made by Walking, A' (Long) 190
Little, Barbara 78
Livingstone, David 267
location relativity 177
Lock, G. 112
London Underground map 5, 190, *191*
Long Barrows of the Cotswold (Crawford) *56*, 58
Long, Richard 190
Lorimer, Hayden 152, 274
Lucas, Gavin 305, 310
Lumiére, Luelle Magdalon 160

Mabinogi, The 213–214
MacEachren, Alan 256

MacKinder, H.J. 28, 48–51
macro-scale analysis 102
Maitland, F.W. 22, 28
'Major Natural Regions, The' (Herbertson) 51
Manchester International Club 61
Manchester Resolution 61
map art: background information 177–178, 183–185; communications process and 178–180, 184; encoding process and 179–180; map games 192, *193*, 194, *194*, *195*, 196–197, *196*; map-making and 183–185, 197–198; mapping process and 178–181; materials 189–190; movement maps 190, *191*, 192; noise and 178–179; objects and 182; reach of 184; space and, social 181–183; symbology and 178–181, *180*, 185, *186*, *187*, 188–189, *188*
map games 192, *193*, 194, *194*, *195*, 196–197, *196*
map-making: autobiographical example 281, *282*, 286–287, *287*, 294–296, *295*; creative 308; in digital world 284–285; ethics systems and guidelines 285; feminist geography and 81–82; format for transmission of information and 177–178; Geographical Information Systems and 281, *282*, 296; improving 294–296; literary criticism analogy and 184; map art and 183–185, 197–198; Map Orkney Month project and 163–164; map projections and 283, *283*; map users and 308; messages transmitted and 197–198; military methods as archaeological guides and 82–86; overview 304; Pausanias and 307; politics of 74; quantum theory and 288–289, 291; questions 304; spatial scales and 289, *290*, 291; style and skill of cartographer and 303, 309; Uncertainty Principle and 288–289, 291, *292*; *see also specific name of cartographer*
Map Orkney Month project case study: aim of 163; contributions to 164; description of 5, 162; focus of 5, 7; imagination and 167; individual mappings 164–168, *164*, *165*, *166*, *167*, *168*; limitations of 169; map-making and 163–164; split screen audio-visual experience of 167, *168*
mapping: access to 270; active 159; antiquities 82–83; archaeology and, development of modern 37–38; arguments 236–242; Çatalhöyük (Turkey) case study and 271–278; collaborative 156–158, *157*, *159*, 162; communication model of 236; Crawford and 37–38, 44; critical 1–3, P11; democratisation of 269; digital maps and 269–270; experimental mapping and 147–149, *148*; fantasy and 81; Fleure and 37–44, *39*; future research 7–9; Global Positioning Systems *157*, 158, *159*; limitless 12; monuments in landscape 306–307; paper P17, 273–275; passive 158–159; Peake and 37–38, 42–43; as performance 37; *Periegesis* P7; political agency of Western 2; practices and rules 7–9; process 178–181; psychogeographic 8, 224; regional geography and making of modern archaeological 48–53, *52*, *54–55*, *55*, *56*, *57–59*; of roads 46–47, *47*, *48*; spatial 27–28, 30, 32, 157, 236; speed of 269–270; tablet PC 275–276; trends in, extending 10; value of 37; *see also specific type*
'Map of Primitive Britain' (Fleure) 51
map projections 283, *283*
maps: aesthetics 2; as analysis 304–306; annotating and coding 7–8; in archaeology, prominence of 1, 137; artefacts and 190; artists' collections of 8; as autobiography 308–310; Cartesian 2, 11, 23, 28, 30–32, 143, 147, 158, 168, 184, 192, 197, 275, 284; communication with dark side of human nature and 304–305; as concrete objects 24; as construction by labours of people 24; Crawford's use of 23; cyborg-ontology and 5; definitiveness and, implications of 132–133; de-politicisation of 149; digital 2–3, 113–114, P15–P19, 268–270, 272–273, 276–277; digital technologies and 5, 8–9; distrust in, phenomenological 30–31; double-map metaphor and 20–21; as embodiment 24–25; of erased objects 305; as escapism 307–308; as evidentiary proof 304; format of 177–179; Fox's use of 23; geographic space and 81; as

god-trick of seeing everything 27, 239; as graphic representations 23; histories of 7, 10–11; history and, conveying 305–306; in Holzminden Prison Camp 37; human effort and, conveying 305–306; hyper-reality of 20–22, *21*; imagination and 167, 310; instability of 10; limitless subjects and 12; location relativity and 177; looking at 310; as malleable object 24; manifestos regarding 10–12; map users and 4, 237; materialized/materializing movement and 25, *26*; material object of 24; materials 189–190; as media 27–32, *29*; as mediating devices 4; movement 190, *191*, 192; navigating terrains and 8; objectivity and 177–178, 182, 241–242; as objects 24; Ordnance Survey 47, *48*, 53, 55, 57–58, 83, 185; paper P17, 273–275; as performance 7, 11, 37; phenomenology and 30–31; pictographs and 308; play and 310; politics of 59–63, 74; portability of 240; as positivism tool 284; possibilities of 31–32; possible activities using 11; power of 241; as production of space 181–183; as prosthetic 25; questions elicited by 11–12, 20; reality and 81; re-appropriation and 183; as representations 23, 81, 178, 306–307; rethinking 3–5, 7, 226; spatial representation and 27–28, 30, 32, 157, 181, 236; as spatial truth 4; studying 310; subjectivity and 182–183; subordination to interlocutor and 305; as system of propositions 238; *terra incognita* and 28; themes in revisiting archaeological 7–8; thick 8–9; thin 4, 207–208, *222*; as tools 23–25, *26*, 27, 37; topological 190, *191*, 192; as truth documents 236, 240–241; as visual renderings 303; world created by humans and 236, 240; *see also* assemblage of materials and practices, maps as; *specific type*
map users 4, 178–180, 184, 236–237, 308
mapwork 4
Marr, Rebecca 167
Marshall, Yvonne 79
Massumi, Brian 154–155
Masurus, Marcus P5
materialized movement 25, *26*
materializing movement 25, *26*
material semiotics 20
Matless, D. 59
McGuire, R. H. 120
McLucas, Cliff 207, 224–225
McLuhan, Marshall 27
McNeilly, L. 185
McOmish, D. 100, 105
measurement 119
media, maps as 27–32, *29*
Megalithic Index 58
Meractor, Gerardus, P14
Merleau-Ponty, Maurice 239, 256
Mickel, Allison 274–275
Mills, Steve 234
mimetical thought P18
Minard, Charles 285, *286*
Mitchell, Katharyne 77
Mlekuz, Dimitrij 234
Monmonier, Mark 304
monuments 107, 112, 117, 125–127, 131–133, 136–137, 196, 306–307; *see also specific name*
Moore, Hazel 165
Moore, Jerry 233
‘moral geographies’ 37
Morea survey P13–P14
Morgan, C. 136
Moss, Madonna 79
Moss, Pamela 87
movement maps 190, *191*, 192
mythology 204, 206, *205*, *206*

Napoleon’s advance into Russia 285, *286*
narration 204; *see also* storytelling
nationalism 61
National Monument Record of Scotland 131
neogeography P17
networks of sociality and knowledge 38–44, *39*, 63
New Archaeology 103, 147
Nile Delta map 6
noise 178–179
non-representational perspective (NRT) 271
Northern Cape (South Africa) project 73–74, 85, 87–88, 306
November, Valerie 269

objectification, acoustic *257–259*
objectivity 100, 103–107, 177–178, 182, 241–242
object orientated approaches 154
observation 119
ocularcentrism 257–259
Ogle Hill survey: as crafted survey 122–124, 133–134; dialogue contributions and 124, *125*; final visit and 134, *135*; first phase of 124–126; interpretation of 122, *123*, 126–129, 131–132; Ordnance Survey depiction and 122, *122*; reconnaissance visits to 124–126; second phase of 126–129; time-lapse photographs and 127, *127*, *128*, *129*
'one map, one period' time-slice approach 58
Ong, Walter 237
onto-ethico-epistemiology 207
Order of Woodcraft Chivalry (OWC) 62
Ordnance Survey 22, 47, 100, 149
Ordnance Survey (O.S.) maps 47, *48*, *53*, *55*, *57–58*, 83, 185
Ordnance Survey's Retriangulation of Great Britain 47
O'Reilly, Emily 222
Orkney mappings: active mapping and 159; collaborative mapping and 156–158, *157*, *159*, 162; experimental mapping and 144; festival and (2014) 157–158; island walk 157–162, *159*, *161*, *163*; passive mapping and 158–159; SITE 71 and 160–162, *161*; walkover survey of islands and 157–162, *159*, *161*, *163*; *see also* Map Orkney Month project case study
O'Rourke, K. 8

Paglen, Trevor 152–153
palimpsest metaphor: archaeologists' use of 21–22; Crawford's conception of 21, *21*; as cumulative and incremental 304; discussion around 21–22; exploration of, further 32; Johnson and 20–22; nonneutrality of 305; as process versus product 21–22
'Pan-Katarics' 45
Papay mapings 156–162, *157*, *161*
paper maps P17, 273–275
Parish Mapping Project of Common Ground *5*
passive mapping 158–159
Patterson, T. 79
Pausanias P2–P3, P5, P7, P9–P10, P16, P26, 307; *see also Periegesis* of Pausanias
Pavlovskaya, Marianna 241
Peake, Carli 43, 45
Peake, Harold John Edward 37–38, 42–44, 50–51, 57–58, 60–63
Pearson, Mike 5, 207
Peloponnesus map P13
performance, maps as 7, 11, 37
Periegesis: aspirations of author and P4; as book rolls P4; chain of production and P5–P6; Chthonia and P2–P3; as codex P4, P6; copies of P5; excerpt P1, P3–P9; mapping and P7; measurement of peninsula and P10; order of text P8; readership and P4; summer festival and P3; toponymic updating and P7; *see also* Hermion/Ermioni description and mapping project
Perkins, Chris 236, 240, 256, 270
'Personality of Britain, The' (Fox) 53, *54–55*
Petchenik, B.B. 178
phenomenological archaeology 19
'phenomenological walk' 30
phenomenology 19, 30–31, P18
Phillips, Charles 62, 82
photogrammetry 84
Pickles, John 237, 241, 270
pictographs 308
Piggot, S. 185, *187*
pilgrimages 46, 309
pink noise 234–235
plane table 137
Plant Rhys Ddwfn folk lore land 221
play and maps 310
politics of maps and map-making 59–63, 74
Poller, Tessa 307, 309
'Pompeii effect' 258
possibilism 50–51
Post-processional Archaeology 150
post-structuralism 20
Pouncett, J. 112
pragmatology 212–213
prehistoric geography 51–52
Priestman, Rosey *157*, 165
Principes de géographie humaine (Vidal) 50

Production of Space, The (Lefebvre) 181
Proof of Concept (POC) pilot test 214
prospector theory 52
Proust, Marcel 215
Psychogeographical Mark-up Language (PML) 8
psychogeographic mapping 8, 224
Public Archaeology 2015 project 167
Public Lab Balloon Mapping Tool Kit 210, *210*

quantum theory 288–289, 291
Queneau, Raymond 303

racial characteristics distribution map 39, *39*
Randall, H.J. 22
reality 81, 205
Reclus, Elisee 61
reconnaissance 119, 124
recording 132
reflexive approach to archaeology 119–120
regional geography 5, 48–53, *52*, *54–55*, *56*, *57–59*
representations, maps as 23, 178, 306–307
Ricoeur, Paul 203
Ridgeway Base 47
roads, mapping of 46–47, *47*, *48*
Roberts, Les 218
Robinson, A.H. 178
Rock Art Institute (Wits University, Johannesburg) 73
rock art panel in Eggerness area 192, *193*
Roman Britain 47, *48*, 281, *282*
Roman maps P11
Roman Oxfordshire pottery distribution map 7, *29*
Roskams, S. 104
Royal Commission on Ancient and Historic Monuments in Scotland (RCAHMS) 102, 117, 122–124, 126–127
Royal Commission on Ancient and Historic Monuments in Wales (RCHMW) 102, 117
Royal Commission on Historic Monuments in England (RCHME) 102, 117–118
Royal Geographical Society 40

Schiffer, M. 21
Schiffer, S. 241
Scolari, Carl 214–215
scouting 62
Scullin, Dianne 305, 308, 310
Segsbury hillfort ditches map 188, *188*
sensory map 239; *see also* acoustic mapping
settlement archaeology approach 28
Shanks, Michael 4, 120, 207, 212, 257
Shapin, S. 241
Shearer, Doris 165
Sidebotham, S. E. 105
Situationists 8
Smith, Angèle 83–84
Smithson, Robert 158
Snow, John 285
'social heritage' 61
Sociological Society 60
soundscape *see* acoustic mapping
Sounds of Stonehenge Project 234
South African rock art 73–74, 85, 87–88, 306
South Dorset Ridgeway 19
space: Cartesian ordering of 23; cyber 215; geographic 81; knowledge 215; maps as production of 181–183; performing 81–82; representational 27–28, 30, 32, 157, 181, 236; shared 25, 27; social 181–183
spatial mapping 27–28, 30, 32, 157, 236
spatial practice 181
Spector, Janet 75
Speed, John 185, *186*
St Joseph, Kenneth 62
Stanwick excavation report 188
Stephanus of Byzantine P2
Stevenson, Peter 219–222, *219*
Stonehenge 19, 196, 234
stories 203
storytelling 203–205, *205*, 212, 214, 216; *see also* narration
subjectivity 107, *108*, 113, 149, 178, 181–182
survey 60; *see also* earthwork survey; *specific type*
symbology 178–181, *180*, 185, *186*, *187*, 188–189, *188*
systemic geography 49–50

Tableau de la Géographie de la France (Vidal) 50
tablet PC mapping 275–276
Tabula Peutingeriana map 190
Tan-y-Bwlch site 218–224, *220*, *221*
Taylor, C.C. 29
Taylor, Walter 75
'Ten Mile Walk, A' (Long) 190
terra incognita and maps 28
Theoretical Archaeology Group (TAG) conference 9
thick maps 8–9
thin maps 4, 207–208, *222*
Thomas, Antonia 156
Thomas, Julian 19, 30–31, 85–86, 257–259
Thompson, Nato 152–153
Thompson, Seton 62
Thrift, Nigel 271
Tilley, C. 19, 30–31
Till, Rupert 234
time-lapse photography 127, *127*, *128*, *129*
Tomášková, Silvia 306
tools, maps as 23–25, *26*, 27
Topographical Atlas of European Belongings (Awan) 208
topological maps 190, *191*, 192
topyonymic updating P7
transmediality 214–216, 225
Tulloch, Helga *165*

Uber Archaeologist (map of body parts) 4
Uncertainty Principle 288–289, 291, *292*
unmanned airborne vehicles (UAVs) 110, 112–113, 307
utopic ideas of Peake 60–61

Valdez-Tullett, Andrew 308
Venetian maps P11
Vidal de la Blanche, Paul 50–51
Virtual Reality 148
'Visiting' (Mörling) 89
Vitaliano, Dorothy 204
Voeglin, Salomé 254

'walk the walk' 30
'Wallingford *Burh* to Borough' project 106
Wallingford Castle hachure plan *101*
Washington, George 305
wayfaring 133
Webb, Dave 167
Webmoor, Timothy 4, 257
Weller, Steven 233
Wells, H.G. 59
What This Awl Means (Spector) 75
Wheeler, Mortimer 188
Whittaker, Jacob (Jake) 214, 219–220, *219*, 222–223
Wickstead, H. 4, 309
wildlife area maps, protected 238
Williams-Freeman, J. P. 46, 53, 59
With Alidade and Tape 118
Witmore, Christopher 4, 240, 253, 306–308
Wood, D. 237–238, 241

Y Bont/The Bridge 213–218, *217*

Zitterkopf, R. E. 105

Taylor & Francis Group
an **informa** business

Taylor & Francis eBooks

www.taylorfrancis.com

A single destination for eBooks from Taylor & Francis with increased functionality and an improved user experience to meet the needs of our customers.

90,000+ eBooks of award-winning academic content in Humanities, Social Science, Science, Technology, Engineering, and Medical written by a global network of editors and authors.

TAYLOR & FRANCIS EBOOKS OFFERS:

- A streamlined experience for our library customers
- A single point of discovery for all of our eBook content
- Improved search and discovery of content at both book and chapter level

REQUEST A FREE TRIAL

support@taylorfrancis.com

Routledge
Taylor & Francis Group

CRC Press
Taylor & Francis Group